ACS800

Hardware Manual
ACS800-104 Inverter Modules

ACS800-104 (1.5 to 2000 kW) Inverter Modules

Hardware Manual

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Introduction to this manual

What this chapter contains

This chapter gives the basic information on the manual.

Compatibility

The manual is compatible with the ACS800-104 inverter modules intended for user-defined cabinet installations.

Safety instructions

Follow all safety instructions delivered with the drive.

Intended audience

The reader of the manual is expected to know the standard electrical wiring practices, electronic components, and electrical schematic symbols.

Contents

- *Hardware description*
- *Cabinet construction*
- *Electrical installation*
- *External +24 V power supply for the RMIO board*
- *Installation checklist*
- *Motor control and I/O board (RMIO)*
- *Maintenance*
- *ACS800-104 ordering information*
- *Technical data*
- *Circuit diagrams*
- *Dimensional drawings.*

Related publications

- *ACS 800 MultiDrive Safety Instructions* (3AFE 64760432 [English])
- *ACS 800 MultiDrive; Planning the Electrical Installation* (3AFE 64783742 [English])
- *ACS 800 MultiDrive Modules; Planning the Cabinet Installation* (3AFE 64783531 [English])
- *ACS800-304 and ACS800-704 Diode Supply Units User's Manual* (3AFE 64494023 [English])
- *ACS 800 Product Reference* (3AFE 64813340 [English]). Contains descriptions of ACS 800 drive products and information on generic options
- Firmware manuals
- Option-specific manuals.

Terms and abbreviations

Term/ Abbreviation	Explanation
CMF	Common mode filtering.
DDCS	Distributed Drives Communication System; a protocol used in optical fibre communication inside and between ABB drives.
Drive unit	See Inverter unit.
DSU	Diode supply unit (consisting of one or more diode supply modules).
DTC	Direct Torque Control.
EMC	Electromagnetic Compatibility.
Frame (size)	Relates to the construction type of the component in question. For example, several supply modules with different nominal powers may have the same basic construction. The term is often used in reference to a group of components that share a similar mechanical construction. To determine the frame size of a component, refer to the rating tables in chapter *Technical data*.
IGBT	Insulated Gate Bipolar Transistor; a voltage-controlled semiconductor type widely used in inverters due to their easy controllability and high switching frequency.
Inverter unit	An entity containing all inverter modules controlling a motor, together with their control electronics, and I/O and auxiliary components.
I/O	Input/Output.
NDBU or ADBU	Types of optical branching unit for fibre links that use the DDCS protocol.
NGPS or AGPS	Gate driver Power Supply board. An optional board within inverter modules used to implement the Prevention of Unexpected Start function.
NPBU or APBU	Types of optical branching unit used for connecting parallel-connected inverter modules to the RDCU.
PLC	Programmable Logic Controller.
PPCS	Power Plate Communication System; a protocol used in the optical fibre link that controls the output semiconductors of an inverter module.
RDCU	Drive control unit. The RDCU is a separate unit consisting of an RMIO board built in a plastic housing. Module sizes R2i to R5i have the RMIO board built-in.
RFI	Radio-Frequency Interference.
RMIO	Motor control and I/O board. Contains the principal inputs and outputs of the drive. Module sizes R2i to R5i have the RMIO board built-in; with larger units, the RMIO is contained within a separate RDCU drive control unit.
THD	Total Harmonic Distortion

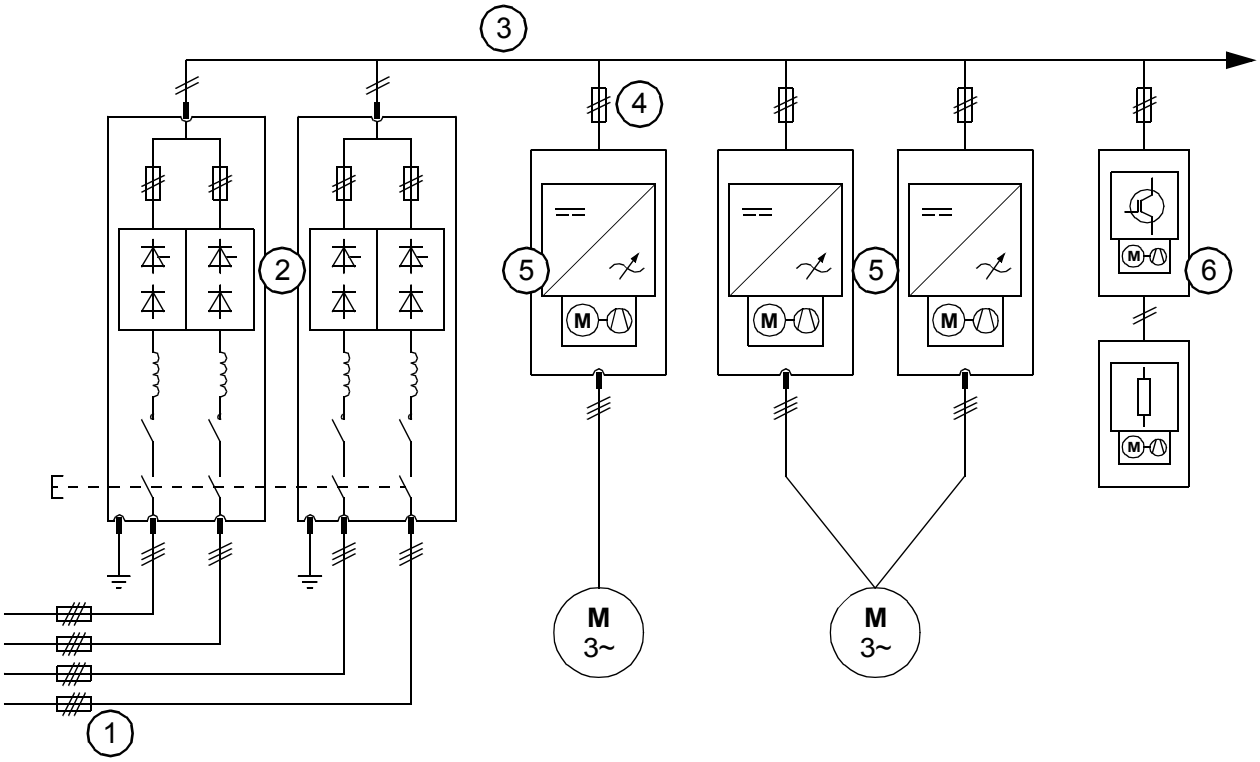
Hardware description

What this chapter contains

This chapter describes a typical drive system and the hardware of the inverter modules. The information is valid for all ACS800-104 inverter modules.

Typical drive system

The diagram below depicts a common DC bus drive system.



1 – Input (AC) fuses
2 – Supply unit (in this example, consisting of two supply modules)
3 – DC bus
4 – Inverter DC fuses
5 – Inverter units (in this example, one of the units consists of two inverter modules connected in parallel)
6 – Brake chopper(s) (optional)

Inverter module hardware

The ACS800-104 range of inverter modules contains components for building the inverter unit(s) of a common DC bus system drive.

The chapter *ACS800-104 ordering information* lists the order codes of the inverter module components. See also the *Dimensional drawings* for dimensions of the modules and related equipment.

The section *Control interfaces* below shows the available control and I/O options.

The ACS800-104 inverter modules have coated circuit boards as standard. A Prevention of Unexpected Start feature is optionally available, consisting of a built-in AGPS board.

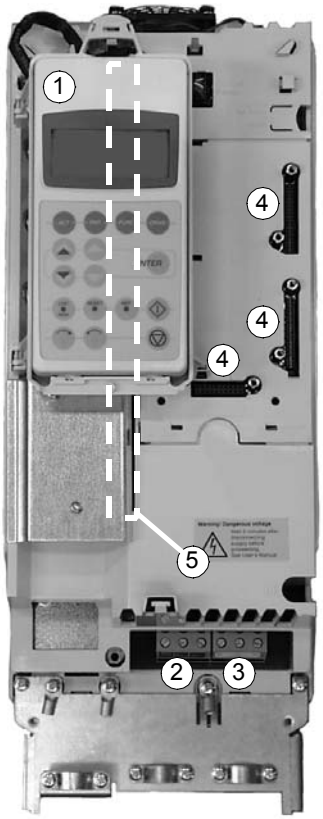
Frames R2i to R5i

The DC input and motor output cables are connected to screw terminal blocks at the bottom of the module, covered by a metal housing.

Frame R2i to R5i modules do not require an external charging circuit.

External du/dt filters are available; see the chapter *ACS800-104 ordering information*.

Module layout (Frame size R3i pictured)

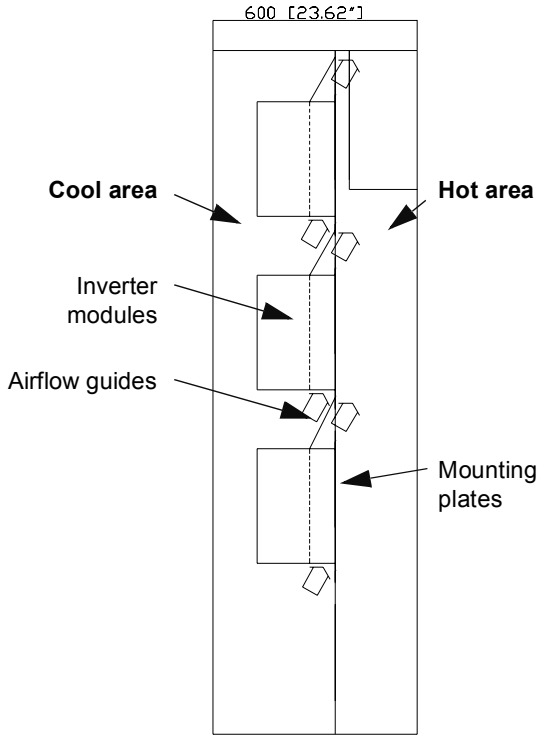


Item	Explanation
1	Control panel mounting platform and CDP 312R control panel (optional). Can be turned aside.
2	DC (input) connections
3	Motor (output) connection
4	Slots for optional I/O modules
5	I/O terminal blocks on RMIO (obscured)

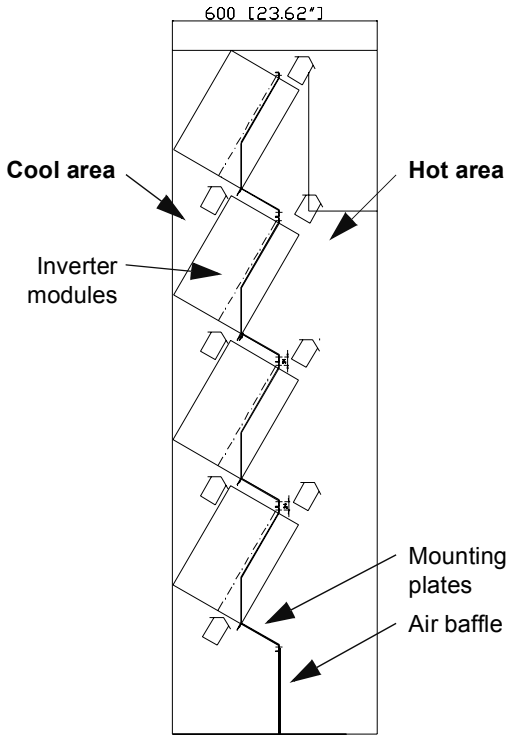
Cabinet layout

Several modules can be installed in one cubicle. The modules can be mounted vertically, or in a slightly inclined position to save more vertical space. See the chapter *Cabinet construction*. Drawings of mounting accessories for both vertical and inclined mounting, suitable for common cabinet systems, are shown under *Dimensional drawings*. (The plates for inclined mounting can be ordered from ABB.)

Vertical mounting



Inclined mounting



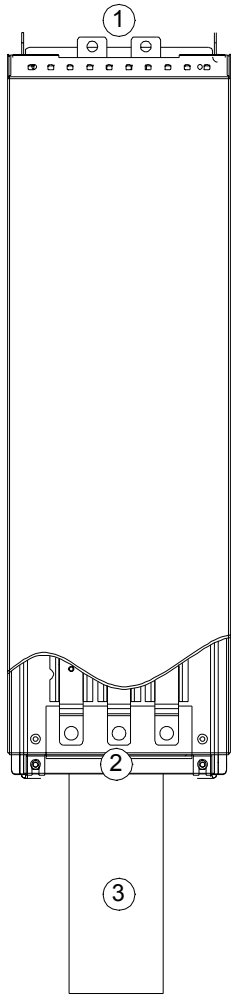
Frames R6i and R7i

Frame R6i and R7i modules have the DC input connection at the top of the module, while the AC connection is at the bottom. The DC voltage is connected to the input busbars either through fuses only or through a switch fuse with charging control circuitry.

The drive control unit (type RDCU) containing the RMIO board is to be installed separately.

The modules require an external cooling fan that has to be supplied from 230 V or 115 V AC auxiliary voltage. For attaching the fan to the module, mounting plate 64138375 is recommended; alternatively, a combined mounting plate/air baffle can be constructed.

Module layout



Item	Explanation
1	DC (input) connections
2	Motor (output) connection
3	Cooling fan

Cabinet layout

See the chapter *Cabinet construction*.

Frame R8i and multiples

Frame R8i modules are used to achieve output powers from approximately 200 kW upwards in single or parallel configurations. R8i modules run on wheels, and can easily be removed from the cubicle for cable installation or service.

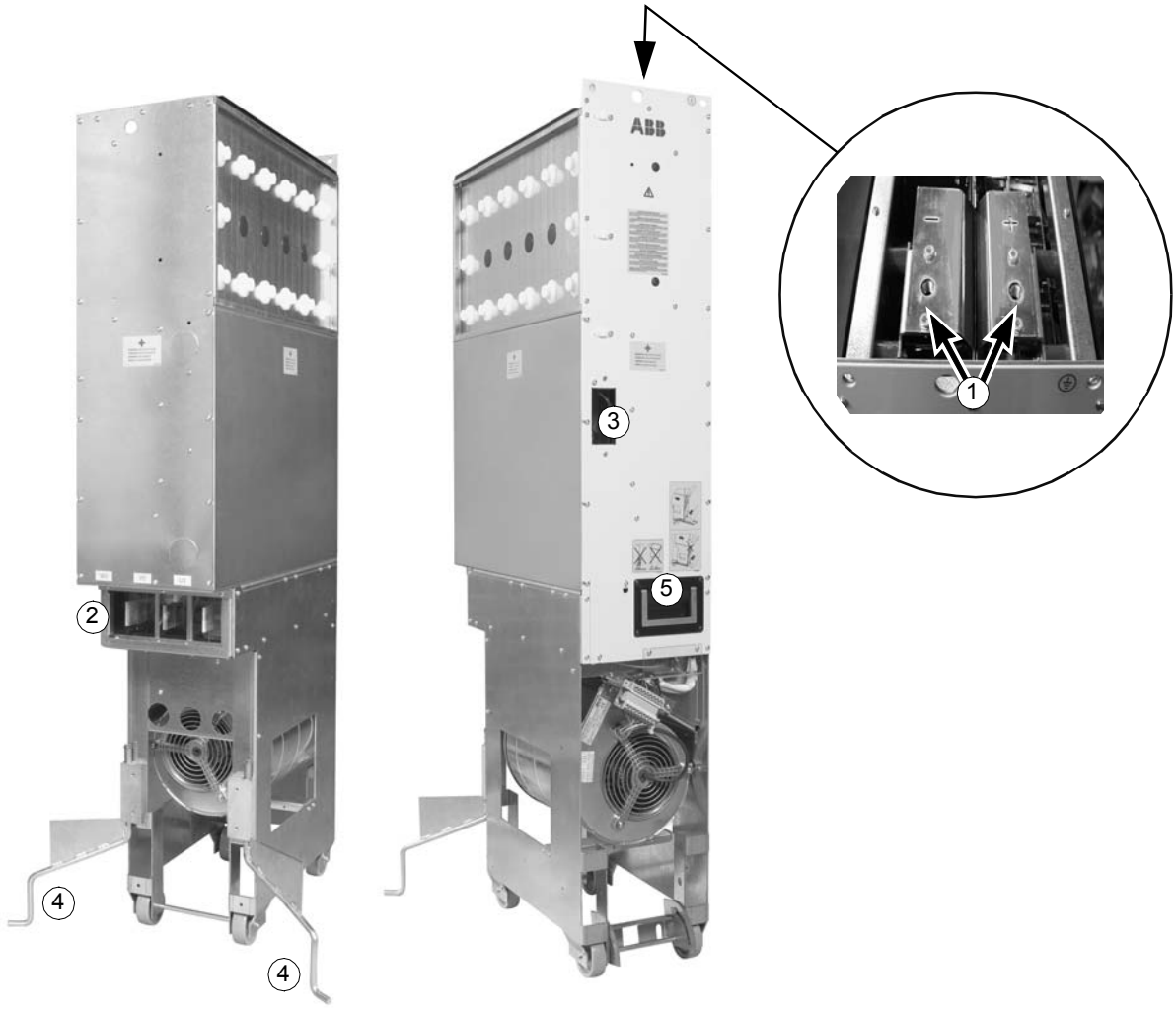
The DC input is located on the top front part of the module. The DC voltage is connected to the input busbars either through fuses only or through a switch fuse with charging control circuitry. Common mode filtering is implemented by running the DC busbars through ferrite cores (optionally available).

The motor connection is via a quick connector at the back of the module that couples when the module is inserted into the cubicle. From the connector, the cables can be run directly through the bottom plate of the cubicle. Each parallel module is cabled separately to the motor, or connected to a common output cubicle by busbars or cables of equal length.

The modules are available with either an internally-supplied, speed-controlled fan, or a fan supplied from an external three-phase (400 V) source. Internal du/dt filters are also available. For information on whether du/dt filtering is necessary, see the document *ACS800 MultiDrive; Planning the Electrical Installation* (3AFE 64783742 [English]). (du/dt filtering must be selected if a common motor terminal cubicle is used. See the chapter *Electrical installation*.)

The drive control unit (type RDCU) containing the RMIO board is to be installed separately.

Module layout



Item	Explanation
1	DC (input) connections
2	Output busbars. To be aligned with the quick connector socket mounted in the cubicle. Direct connection of cables without using the quick connector is also possible.
3	Fibre optic connectors of the AINT board. Connected to the RDCU drive control unit (via an NPBU branching unit in case of parallel inverter modules).
4	Retractable support legs
5	Handle

Cabinet layout

Inverter modules can be installed side by side. The DC fuses and/or switch fuse are to be installed above the modules. The control electronics (RDCU control unit, PPCS branching unit [for parallel modules only], relays and other auxiliary voltage equipment) are to be installed in a separate cubicle. See examples in the chapter *Cabinet construction*.

Using the quick connectors at the motor output enables quick replacement of a module for maintenance, even though direct connection of cables to the module output is also possible.

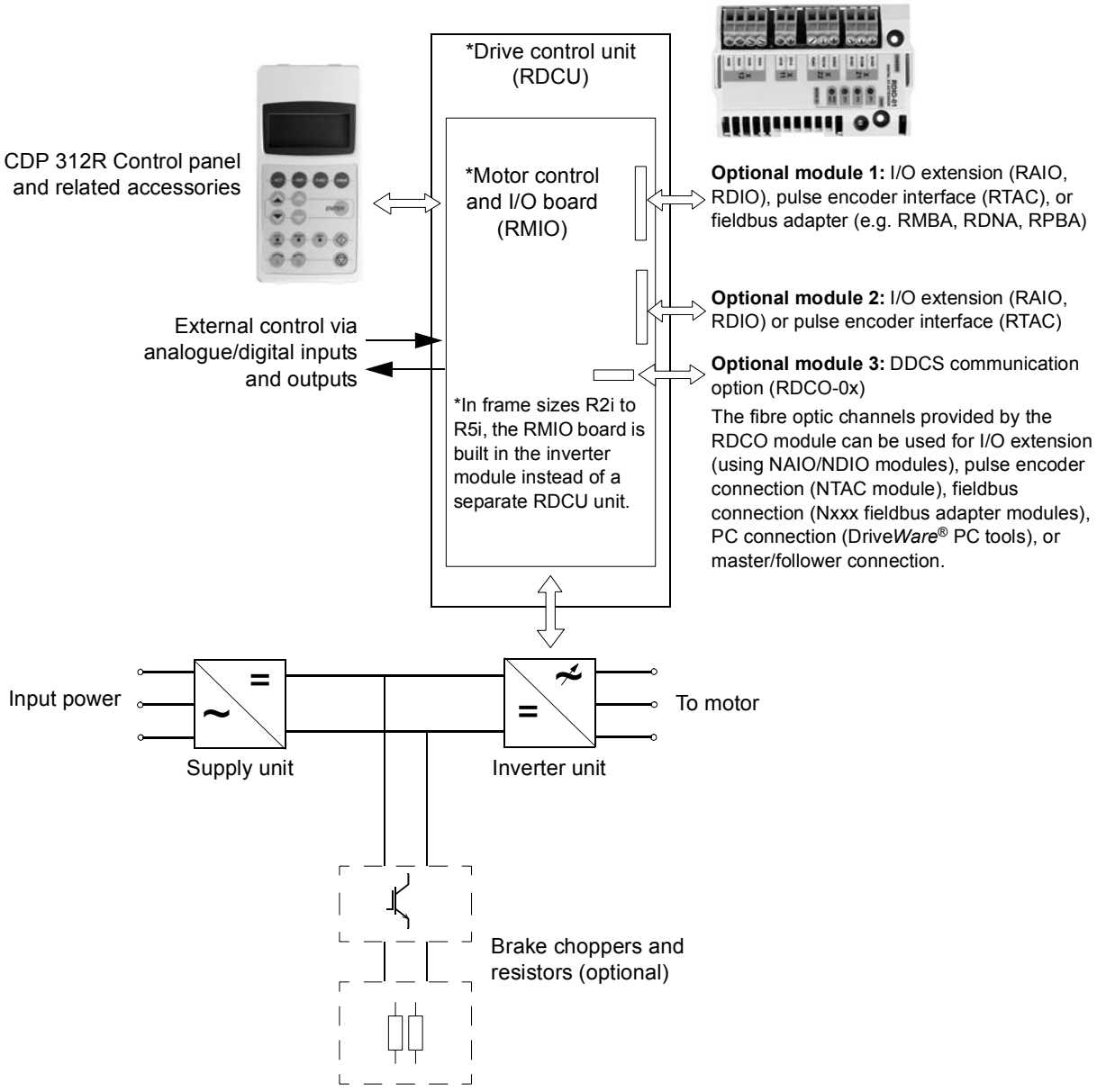
Control interfaces

The following diagram shows the control interfaces and I/O options of the inverter unit.

The front cover of frame R5i has a platform for the CDP 312R control panel; frames R2i to R4i require an additional platform kit if the panel needs to be mounted on the module.

For frame R6i to R8i (and multiples), the control panel is to be installed on a door platform, available as a separate kit.

See the chapter *Electrical installation* for more information.


*Drive control unit (RDCU)
CDP 312R Control panel and related accessories
*Motor control and I/O board (RMIO)
Optional module 1: I/O extension (RAIO, RDIO), pulse encoder interface (RTAC), or fieldbus adapter (e.g. RMBA, RDNA, RPBA)
Optional module 2: I/O extension (RAIO, RDIO) or pulse encoder interface (RTAC)
External control via analogue/digital inputs and outputs
Optional module 3: DDCS communication option (RDCO-0x)
The fibre optic channels provided by the RDCO module can be used for I/O extension (using NAIO/NDIO modules), pulse encoder connection (NTAC module), fieldbus connection (Nxxx fieldbus adapter modules), PC connection (DriveWare® PC tools), or master/follower connection.
*In frame sizes R2i to R5i, the RMIO board is built in the inverter module instead of a separate RDCU unit.
Input power
To motor
Supply unit
Inverter unit
Brake choppers and resistors (optional)

Type code

Each module has a type designation label attached, containing e.g. the type code of the unit. The type code contains information on the specifications and configuration of the unit.

- The first 17 digits form the basic code. It describes the basic construction of the unit. The fields in the basic code are separated with hyphens.
- The option codes follow the basic code. Each option code starts with an identifying letter (common for the whole product series), followed by descriptive digits. The option codes are separated by plus signs.

The main selections are described below. Not all options are necessarily available for all types. For more information, contact your local ABB representative.

Basic code

Digit no.	Name/Description	Alternatives	Description
1…6	Product series	ACS800	
8…10	Construction	104	Inverter module
12…14	Size	0003 and up	3 kVA and up
16	Voltage rating	3	380/400/415 V. Nominal voltage: 400 V.
		5	380/400/415/440/460/480/500 V. Nominal voltage: 500 V.
		7	525/575/600/660/690 V. Nominal voltage: 690 V.

Option codes

Ident. letter	Name/Description	Alternatives	Description
C		C126	Speed-controlled cooling fan supplied from the DC bus. **Frame R8i only.**
E	Filters	E205	Internal output (du/dt) filters. **Frame R8i only.**
P	Protection class	P901	Coated circuit boards. **This feature is standard.**
Q	Safety features	Q950	Prevention of unexpected start (built-in AGPS board).

Cabinet construction

What this chapter contains

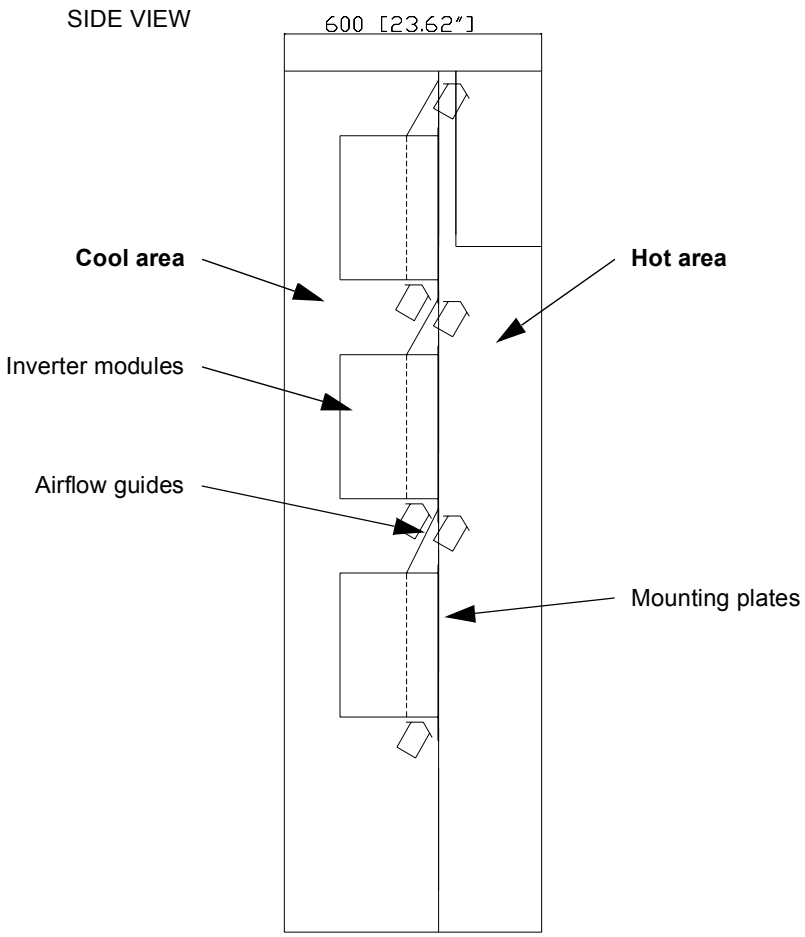
This chapter contains instructions for constructing the cabinet for ACS800-104 inverter units.

Also refer to the document *ACS800 MultiDrive Modules; Planning the Cabinet Installation* (3AFE 64783572 [English]).

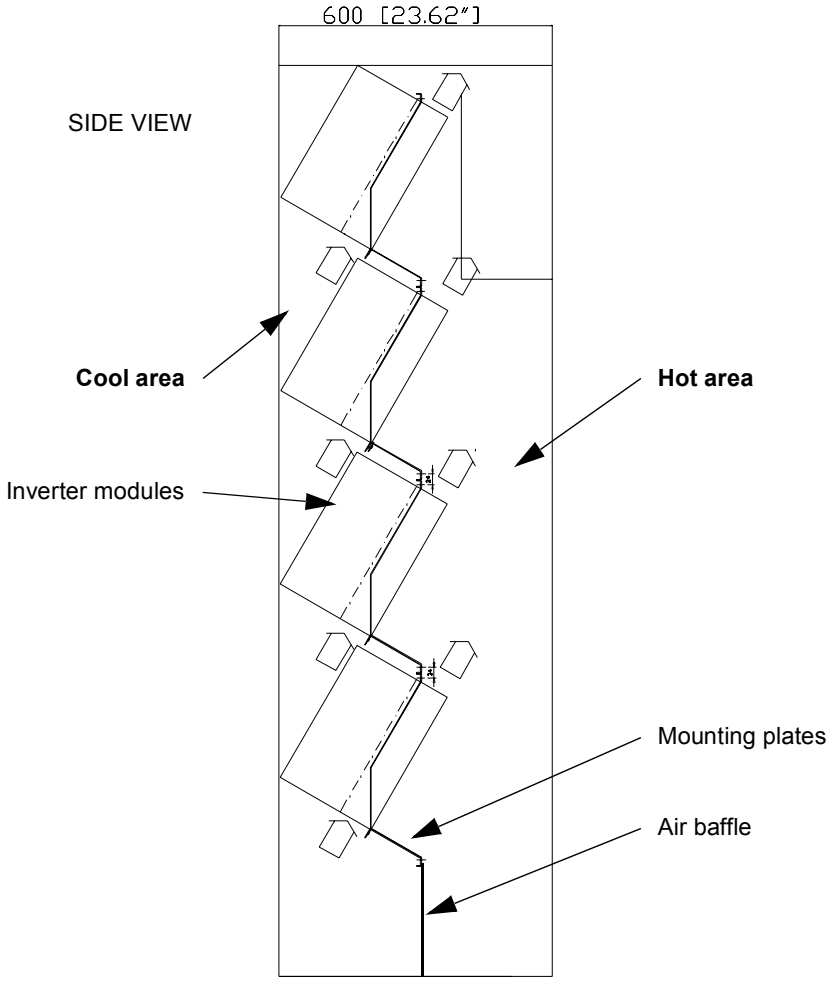
Frame R2i to R5i

Guiding the cooling air flow

The hot air from an inverter module must not be allowed to enter another module. In a cubicle with multiple modules, a practical way of achieving this is to install a mounting plate to separate the cool area (at the front part of the cubicle) from the hot area (back part). The mounting plate can be fastened to two vertical pillars on both left and right. Since the air outlet at the top of the modules points directly upwards, the air must be guided to the hot area. See the example below.



To save vertical space, the inverter modules can be mounted by their flanges in an inclined position as exemplified below.

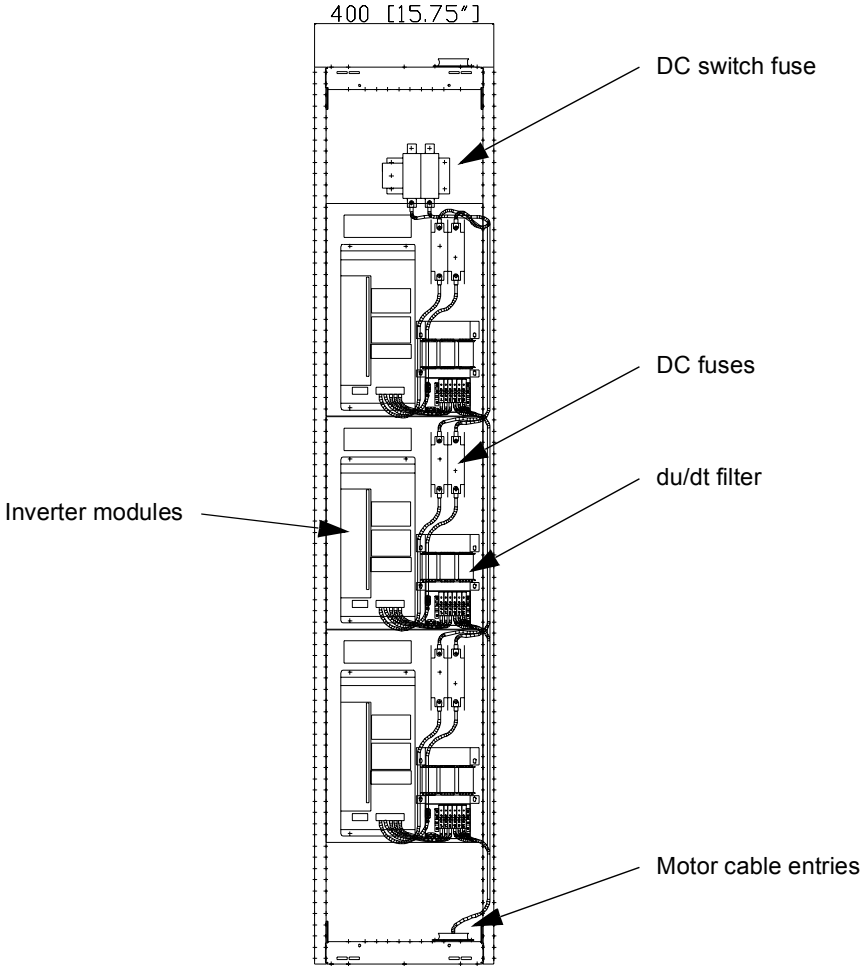


The chapter *Dimensional drawings* presents mounting plates for vertical and inclined mounting positions. The airflow guides needed in vertical mounting are also presented.

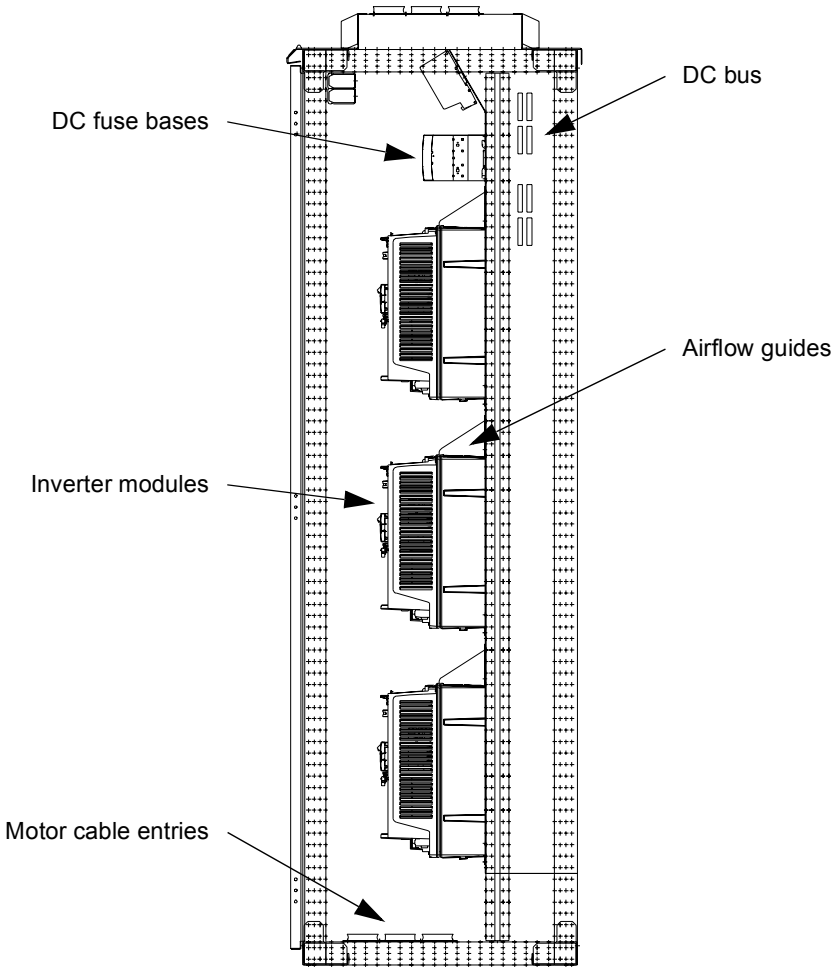
The mounting plates are directly mountable in a 400 mm-wide Rittal TS 8 cabinet system; the outer dimensions and fastening holes can easily be adapted for another system.

Layout examples

The drawing below is a front view of a cubicle with three R2i modules installed on top of each other.



This drawing is a side view of three R3i modules in a 400 mm-wide cubicle.



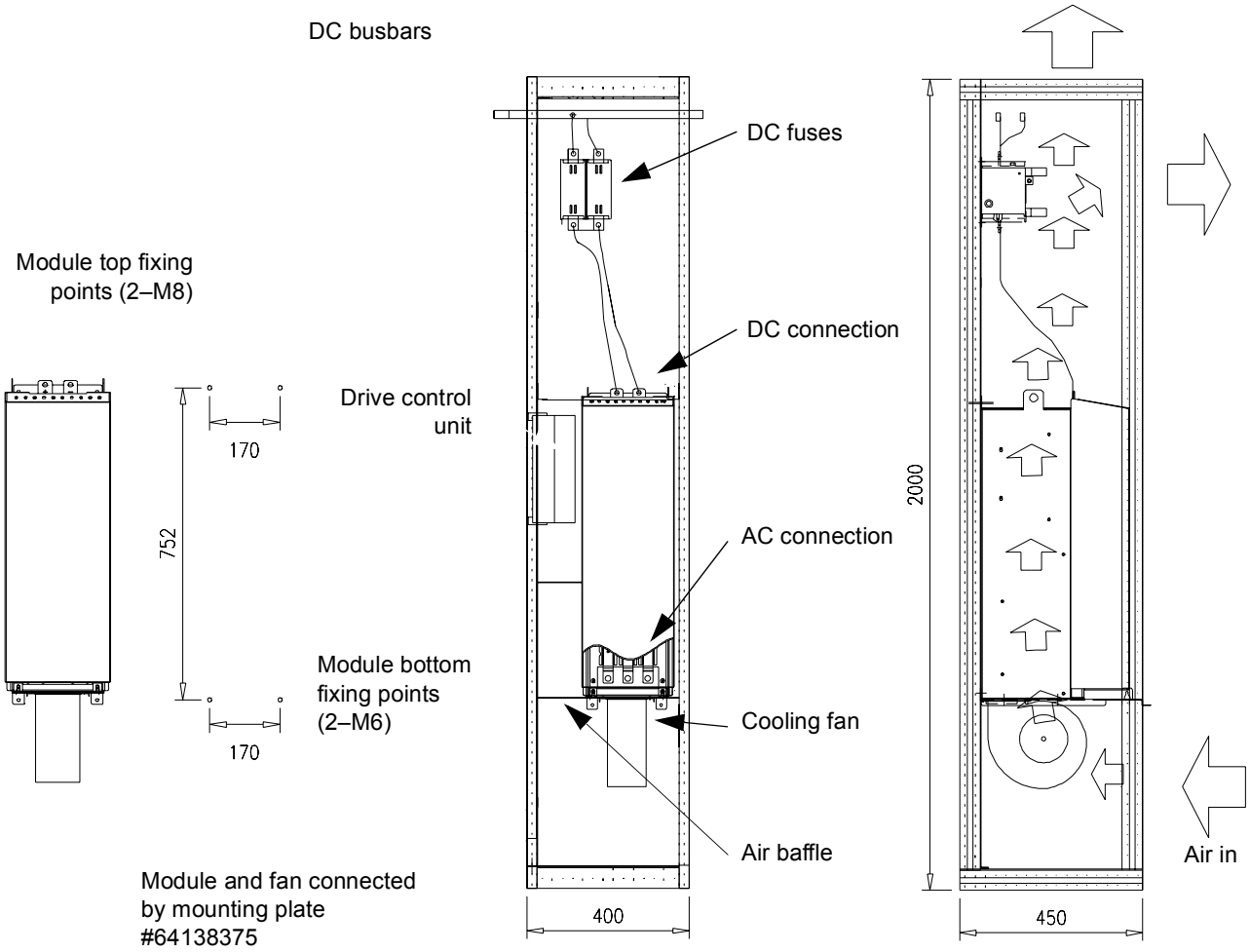
Frames R6i and R7i

The module can be installed in the cabinet using the optional mounting plate (code 64138375) and a separate air baffle. Alternatively, a combined mounting plate/air baffle can be constructed. The fixing points are shown in the cabinet layout examples below.

Several R6i or R7i modules can be installed in one cubicle providing the minimum clearances indicated in the dimensional drawings are followed.

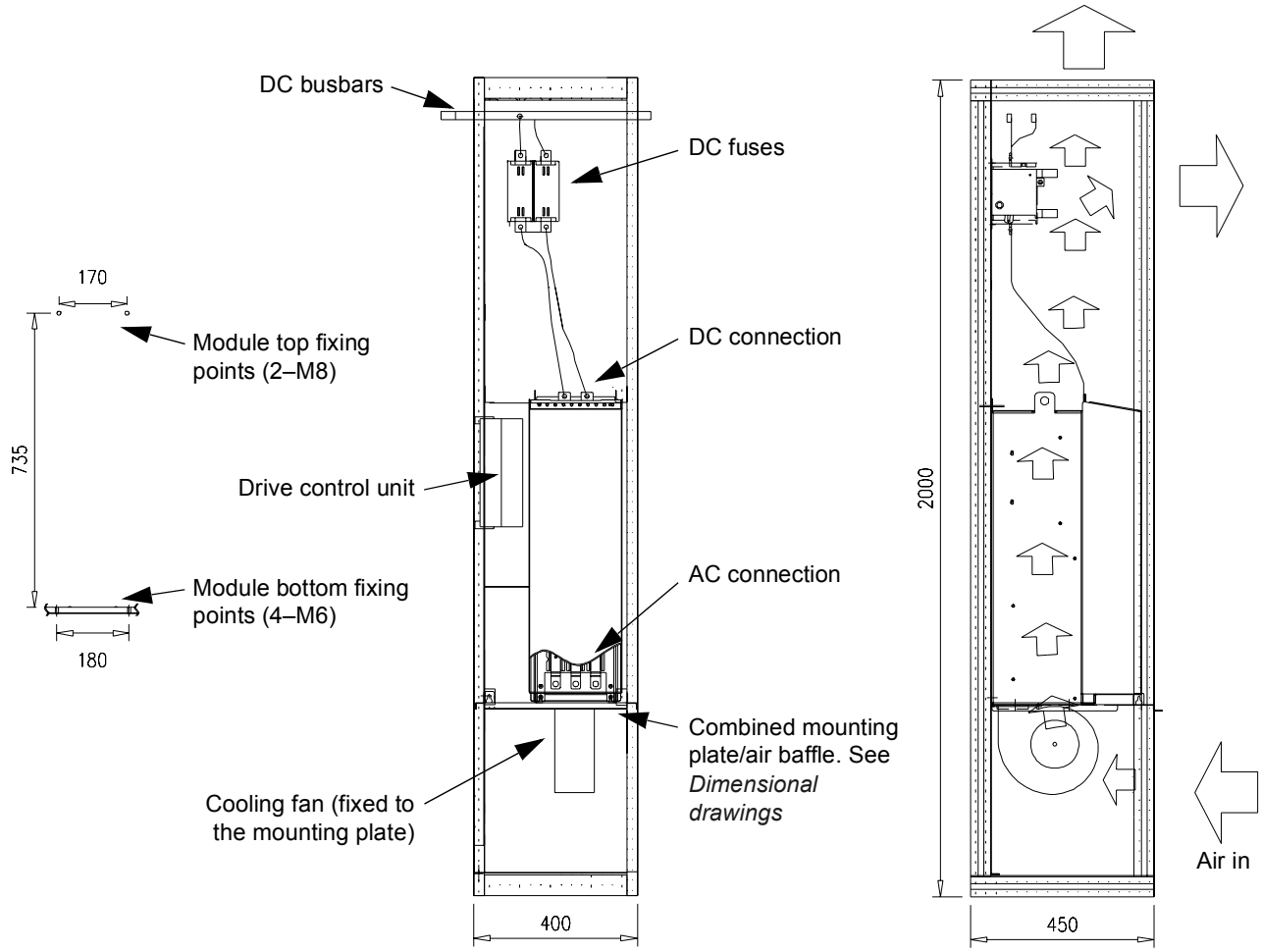
Installation using mounting plate 64138375

The module is fastened by the two fixing points at the top to the rear wall of the cabinet using two M8 screws. The mounting plate (which connects the module and its cooling fan) is fixed to the rear wall of the cabinet with two M6 screws. A separate air baffle must be installed, but it does not have to carry the weight of the module.



Installation without mounting plate 64138375

The module is fastened to the rear wall with two M8 screws, and to a combined mounting plate/air baffle with four M6 screws. The cooling fan is also fixed to the plate which has to be strong enough to carry the weight of the module. A suitable design for the mounting plate/air baffle is shown in *Dimensional drawings.*



Frame R8i and multiples

General

See the chapter Technical data for module-specific cooling requirements.

Cooling

In a typical cabinet construction, the air inlet is at the bottom of the cabinet, while the outlet is at the top, ideally on the roof. The inlet may be filtered.

Note: Do not install a filter in the air outlet.

Circulation of air within the cabinet must be prevented. With R8i inverter modules, lateral airflow should be blocked with a collar-type air baffle at the top of each module. Special attention must be paid to covering the gap between the guide at the top of the module and the side wall of the cubicle.

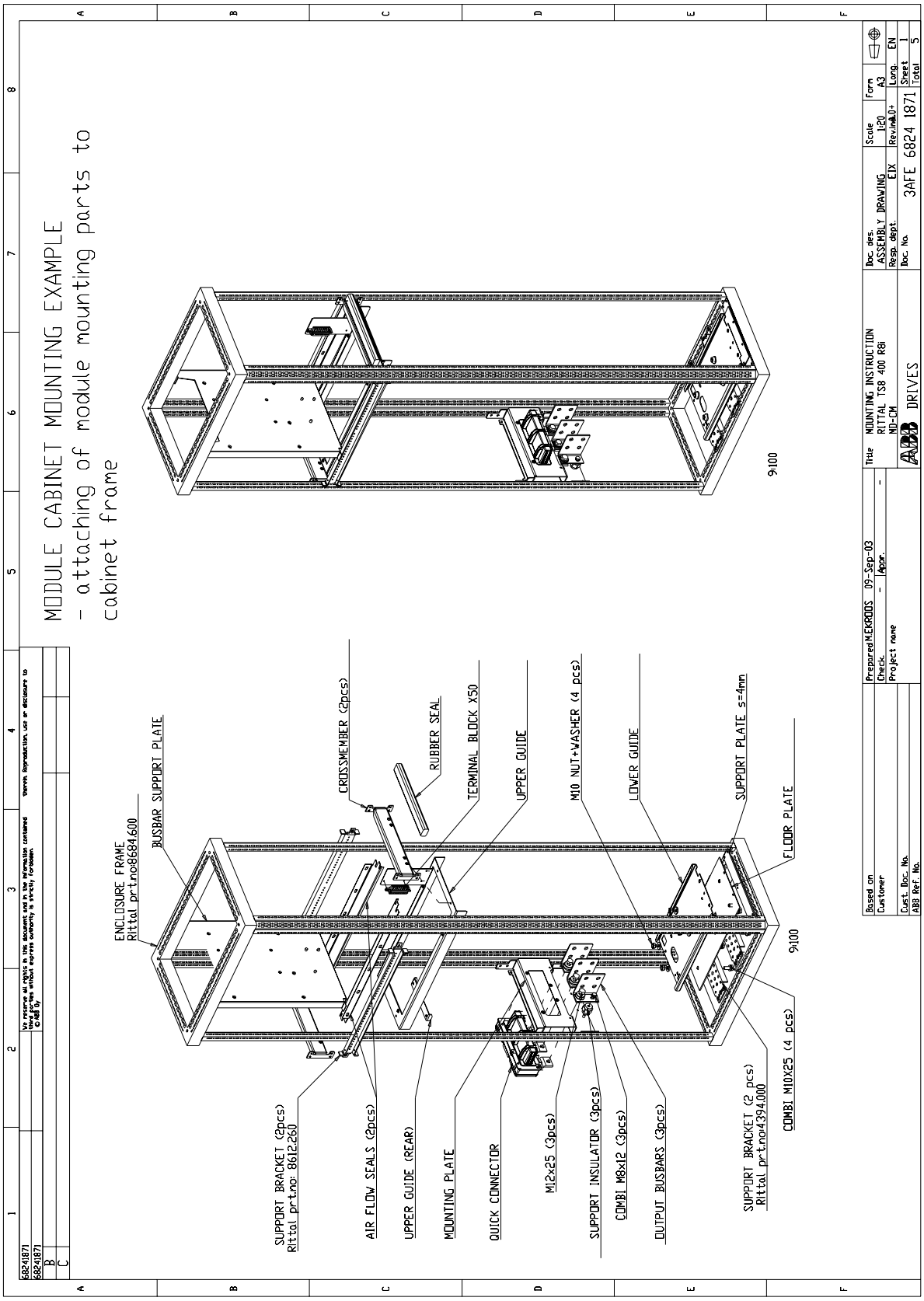
Module extraction/insertion ramp

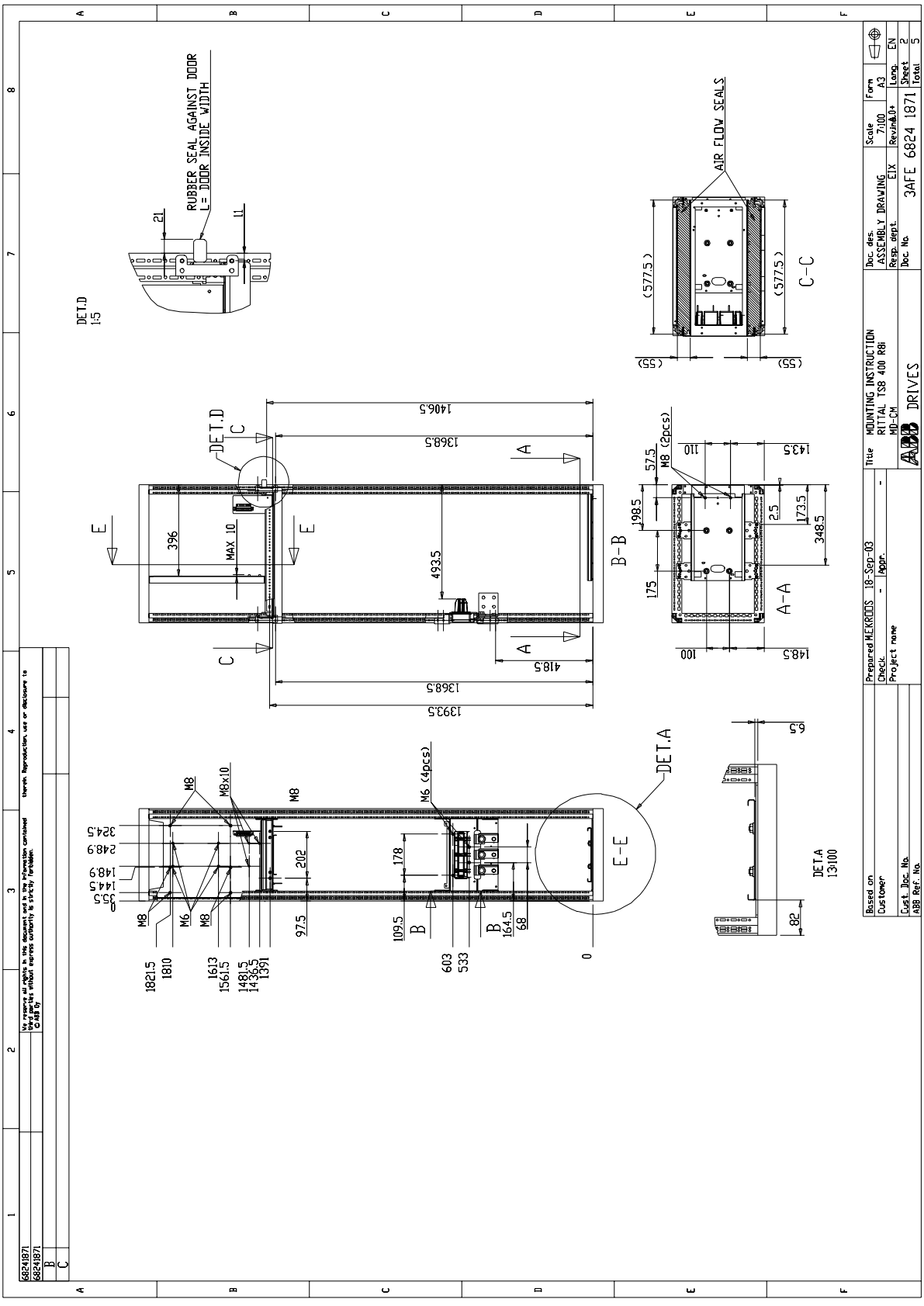
The inverter module is to be inserted into and extracted from the cabinet along a suitable ramp. An example design is shown in *Dimensional drawings*.

Mounting examples

The following pages contain examples of 1, 2 and 3 R8i modules installed into a Rittal TS 8 cabinet frame. In addition, there is an example of 3 R8i modules installed side-by-side.

Single R8i module in a Rittal TS 8 cubicle




RUBBER SEAL AGAINST DOOR
L= DOOR INSIDE WIDTH
DET.D
1:5
AIR FLOW SEALS
C-C
(577.5)
(55)
DET.D
1406.5
1368.5
396
MAX 10
493.5
418.5
1393.5
B-B
A-A
M8 (2pcs)
57.5
110
143.5
198.5
2.5
173.5
348.5
175
100
148.5
M8
M8x10
M6 (4pcs)
324.5
248.9
148.9
144.5
35.5
0
202
178
97.5
109.5
164.5
68
1821.5
1810
1613
1561.5
1481.5
1436.5
1391
603
533
E-E
DET.A
6.5
82
DET.A
1:1.00
Based on
Customer
Cust. Doc. No.
ABB Ref. No.
Prepared MEKROOS 18-Sep-03
Check: - Appr. -
Project name
Title MOUNTING INSTRUCTION
RITAL TS8 400 R81
MD-CM
ABB DRIVES
Doc des. ASSEMBLY DRAWING
Resp. dept. EIX
Doc. No. 3AFE 6824 1871
Scale 7:100
Revision 0+
Form A3
Lang. EN
Sheet 2
Total 5
6824 1871
B
C
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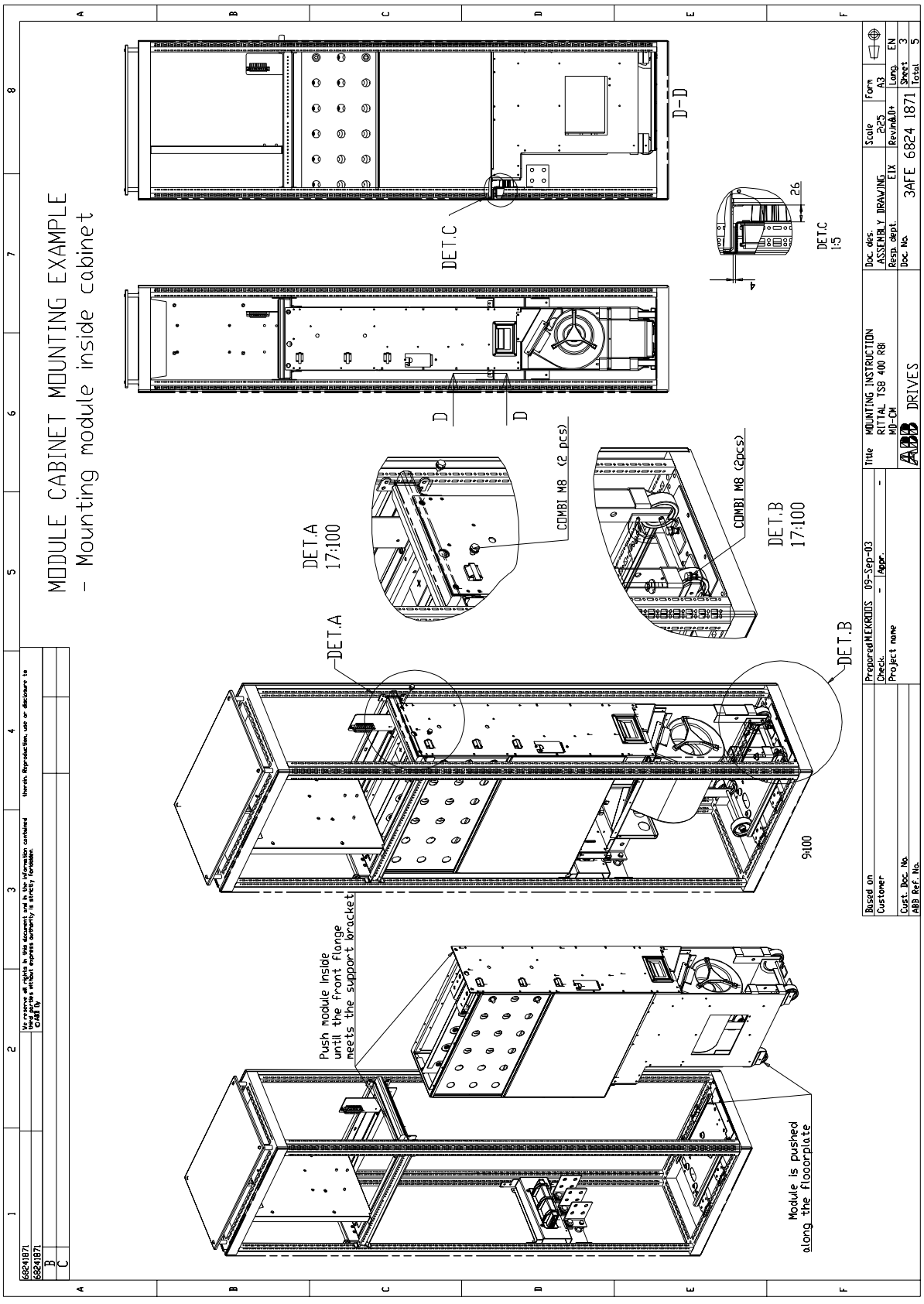
MODULE CABINET MOUNTING EXAMPLE
- Mounting module inside cabinet
D-D
DET.C
DET.C
1:5
26
4
D
D
DET.A
17:100
DET.B
17:100
COMBI M8 (2 pcs)
COMBI M8 (2pcs)
DET.A
DET.B
9100
Push module inside
until the front flange
meets the support bracket
Module is pushed
along the floorplate
Based on
Customer
Prepared MEKRIDIS 09-Sep-03
Check. - Appr. -
Project name
Cust. Doc. No.
ABB Ref. No.
Title MOUNTING INSTRUCTION
RITTAL TS8 400 R8I
MD-CM
ABB DRIVES
Doc. des. ASSEMBLY DRAWING
Resp. dept. EIX
Doc. No. 3AFE 6824 1871
Scale 2:25
Revision 0+
Form A3
Lang. EN
Sheet 3
Total 5
68241871
68241871
B
C
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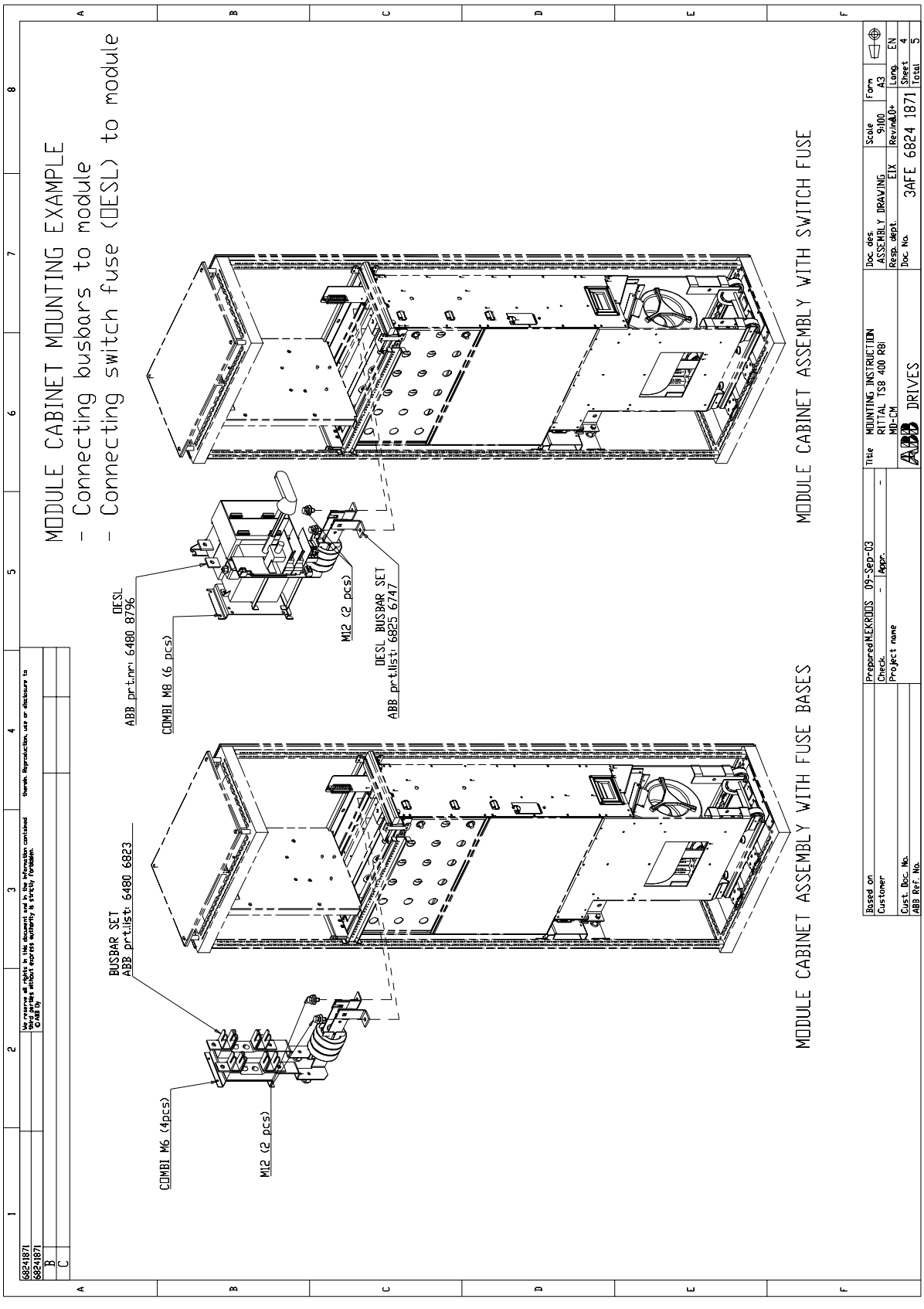
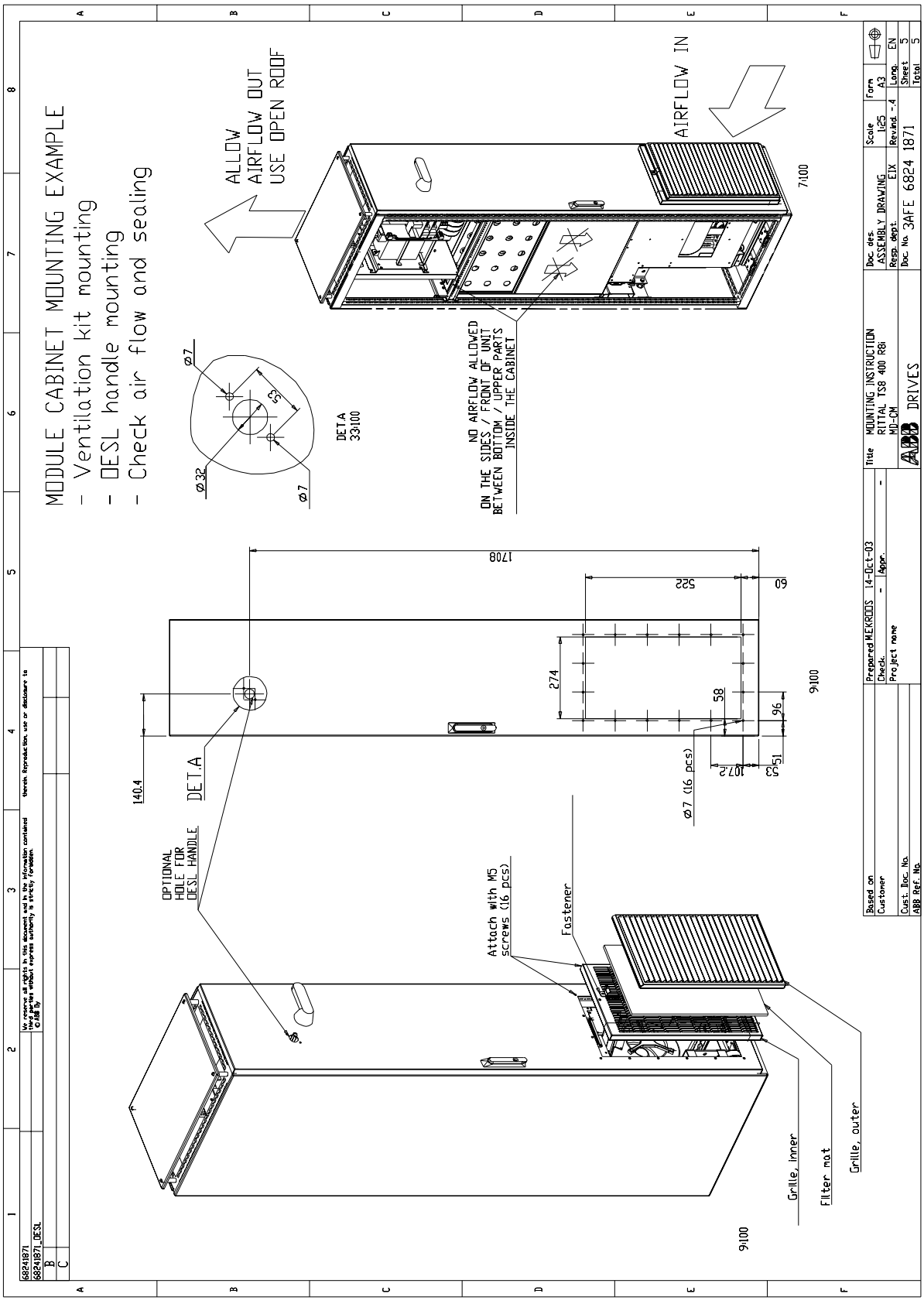
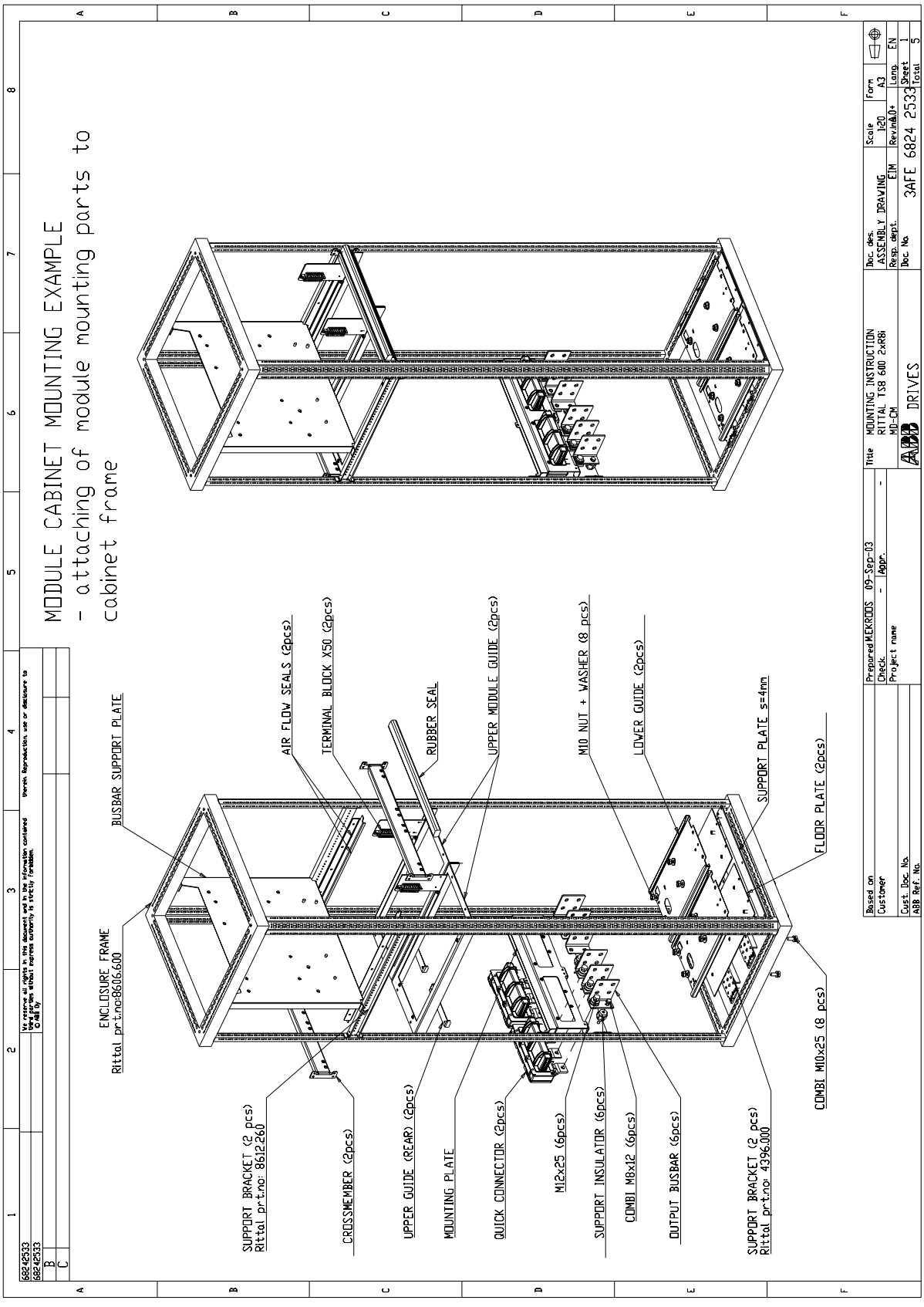
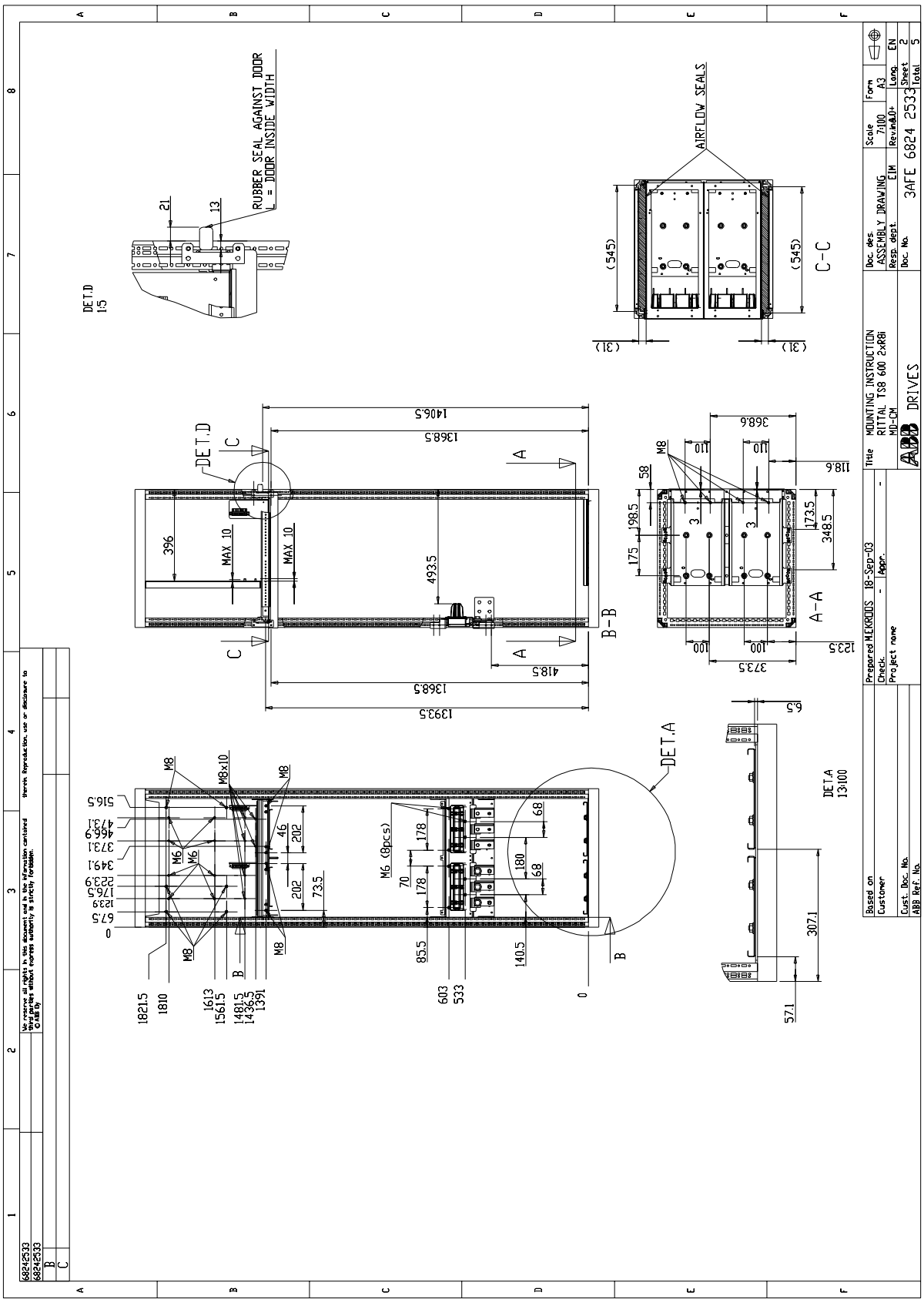
Owner

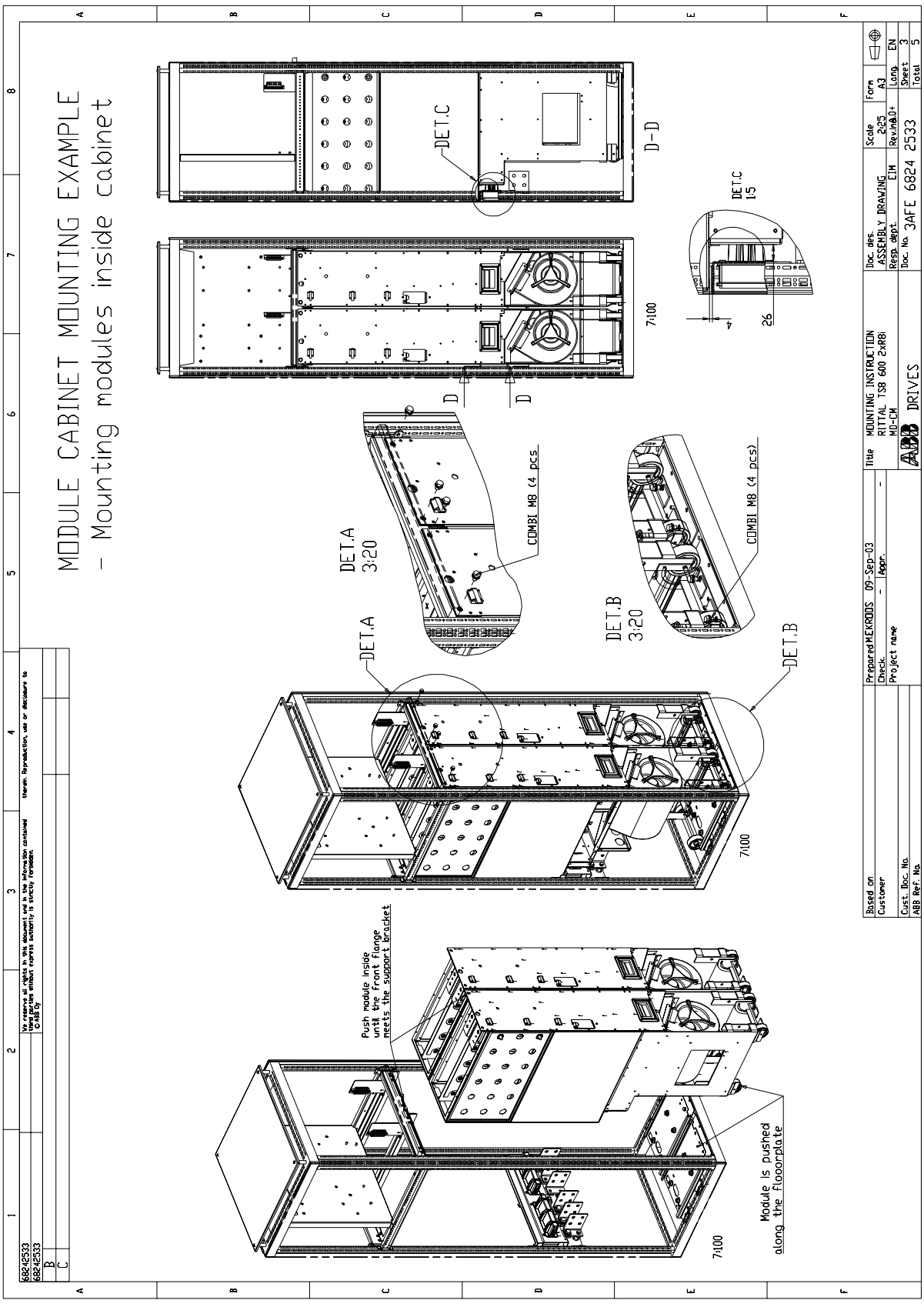

MODULE CABINET MOUNTING EXAMPLE
- Connecting busbars to module
- Connecting switch fuse (DESL) to module
MODULE CABINET ASSEMBLY WITH FUSE BASES
MODULE CABINET ASSEMBLY WITH SWITCH FUSE
BUSBAR SET
ABB prt.list: 6480 6823
COMBI M6 (4pcs)
M12 (2 pcs)
DESL
ABB prt.nr: 6480 8796
COMBI M8 (6 pcs)
M12 (2 pcs)
DESL BUSBAR SET
ABB prt.list: 6825 6747
MOUNTING INSTRUCTION
RITTAL TS8 400 RBI
MD-CM
DRIVES
3AFE 6824 1871


MODULE CABINET MOUNTING EXAMPLE
- Ventilation kit mounting
- DESL handle mounting
- Check air flow and sealing
ALLOW AIRFLOW OUT USE OPEN ROOF
AIRFLOW IN
NO AIRFLOW ALLOWED ON THE SIDES / FRONT OF UNIT BETWEEN BOTTOM / UPPER PARTS INSIDE THE CABINET
DET.A 33100
OPTIONAL HOLE FOR DESL HANDLE
DET.A
Attach with M5 screws (16 pcs)
Fastener
Grille, inner
Filter mat
Grille, outer
ø7 (16 pcs)
1708
522
274
140.4
9100
7100
MOUNTING INSTRUCTION
RITTAL TS8 400 R8
MD-CM
ABB DRIVES
Doc. No. 3AFE 6824 1871
ASSEMBLY DRAWING
Prepared MEKRODS 14-Oct-03
Checked -
Project none
Based on
Customer
Cust. Doc. No.
ABB Ref. No.
6824187I
6824187I_DESL

Two R8i modules in a Rittal TS 8 cubicle




RUBBER SEAL AGAINST DOOR
L = DOOR INSIDE WIDTH
DET.D
1:5
AIRFLOW SEALS
C-C
DET.A
1:3.100
A-A
B-B
MOUNTING INSTRUCTION
RITTAL TS8 600 2xRBI
MD-CM
DRIVES
3AFE 6824 2533


MODULE CABINET MOUNTING EXAMPLE
- Mounting modules inside cabinet
DET.A
3:20
COMBI M8 (4 pcs)
DET.B
3:20
DET.C
1:5
D-D
7:100
Push module inside until the front flange meets the support bracket
Module is pushed along the flooorplate
MOUNTING INSTRUCTION
RITTAL TS8 600 2xR8I
MD-CM
ABB DRIVES
3AFE 6824 2533

1	2	3	4	5	6	7	8

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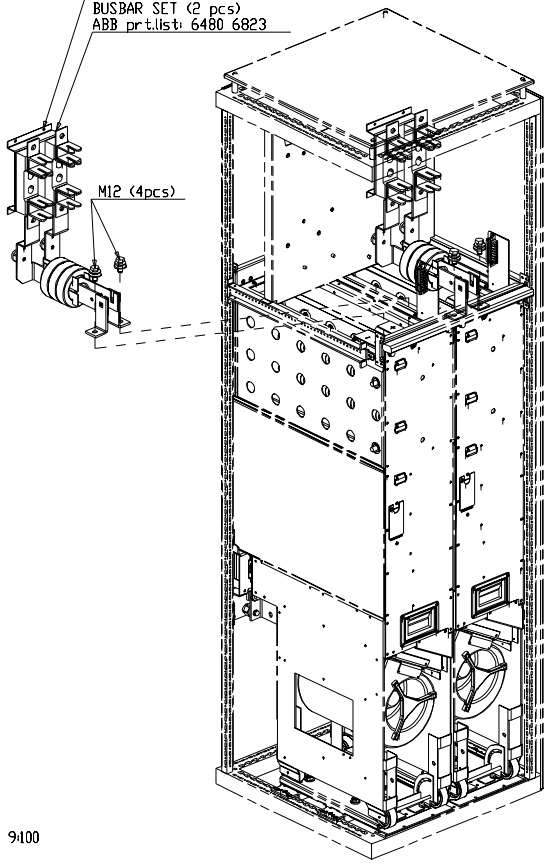
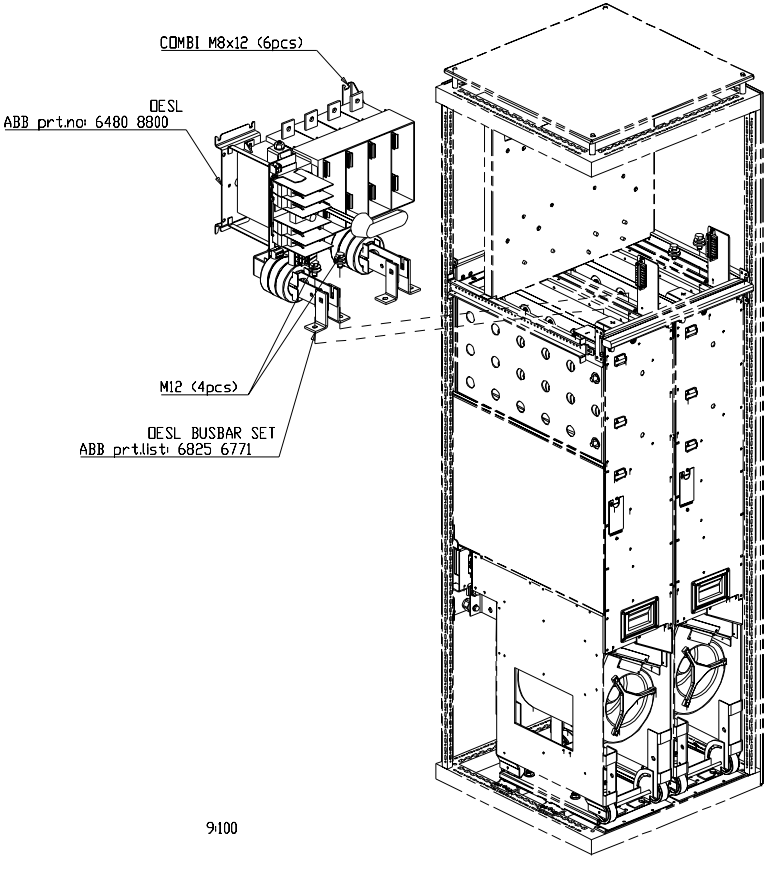
B
C

MODULE CABINET MOUNTING EXAMPLE
- Connecting of busbars to modules
- Connecting switch fuse (OESL) to modules

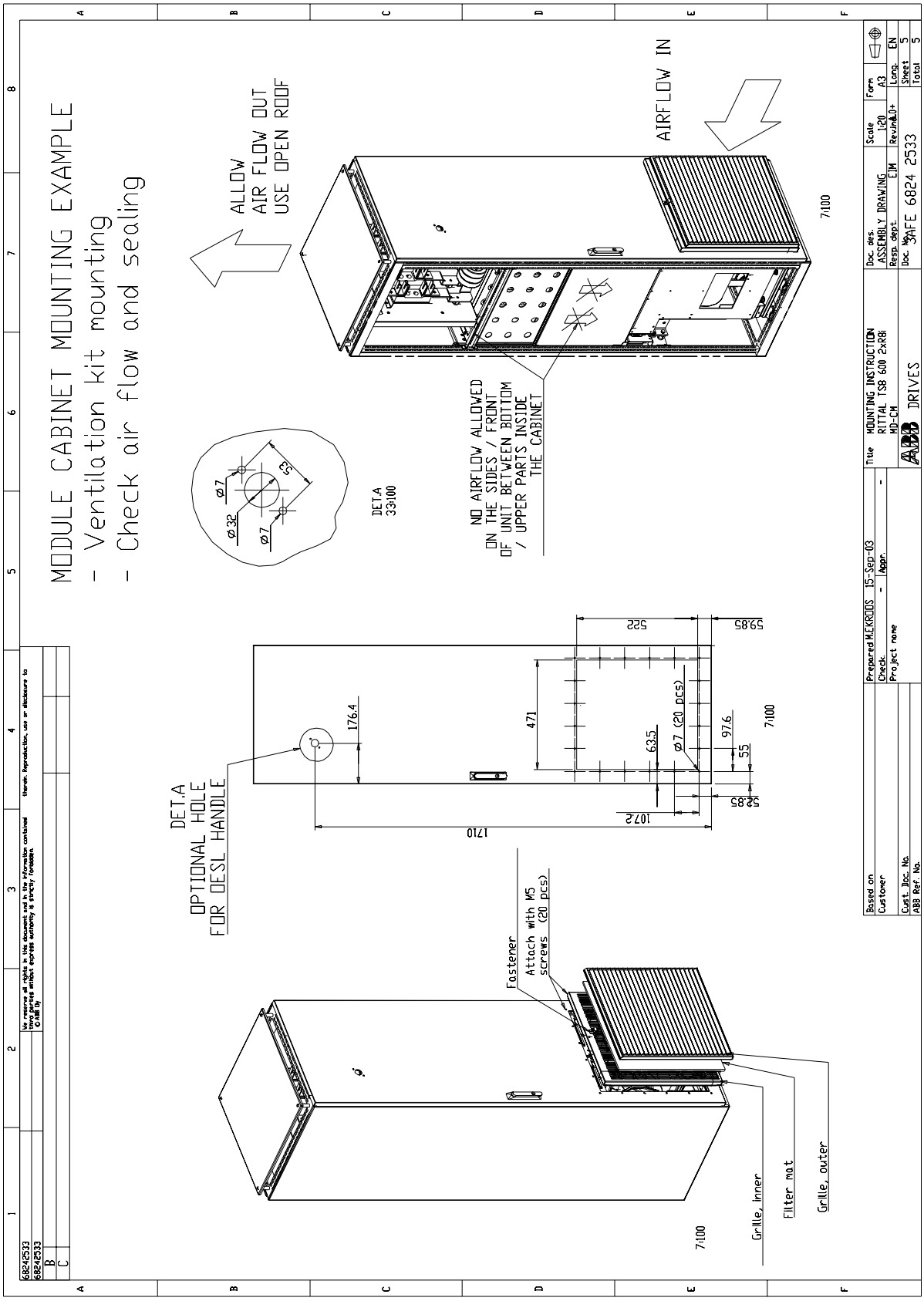


MODULE CABINET ASSEMBLY WITH FUSE BASES

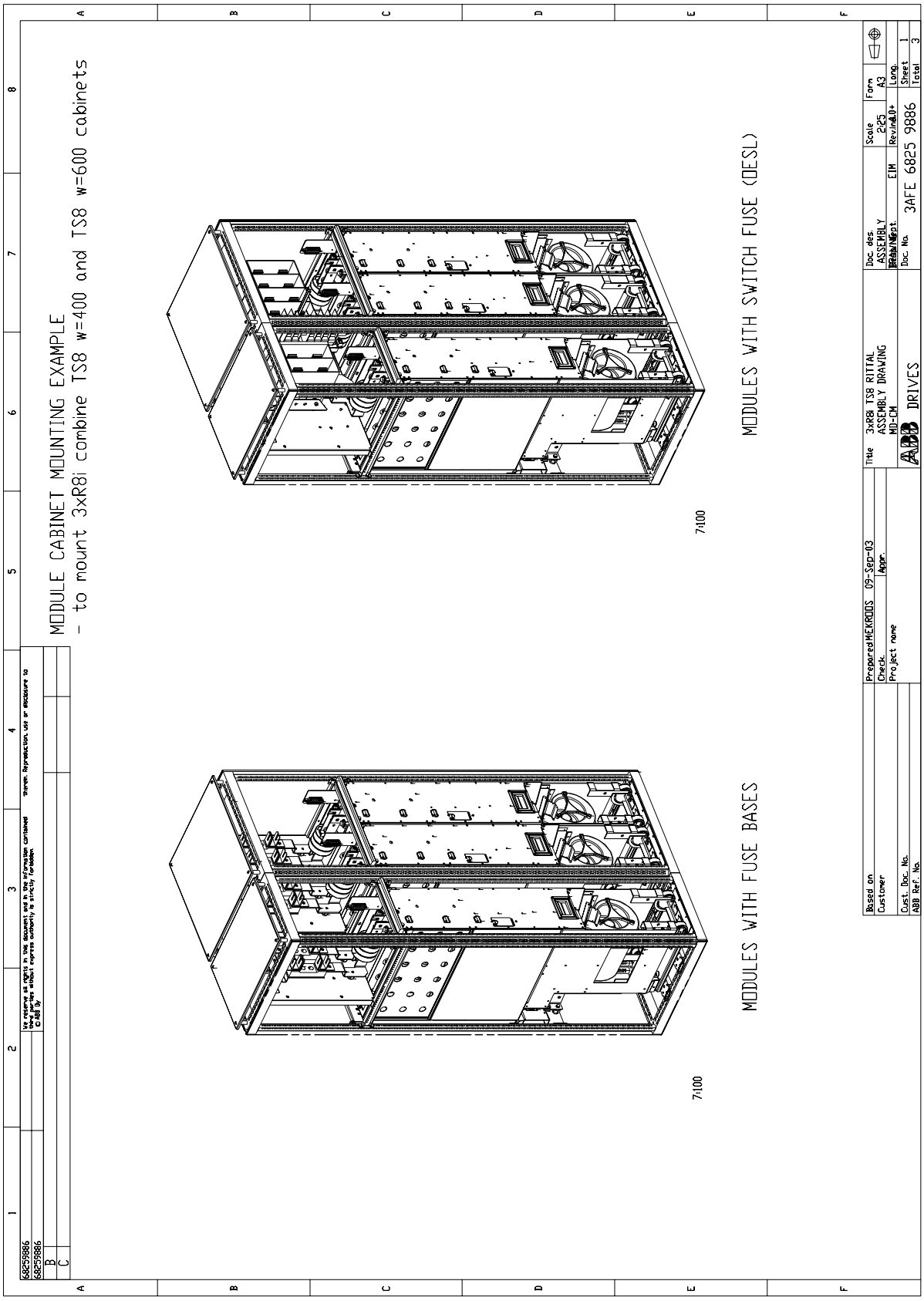


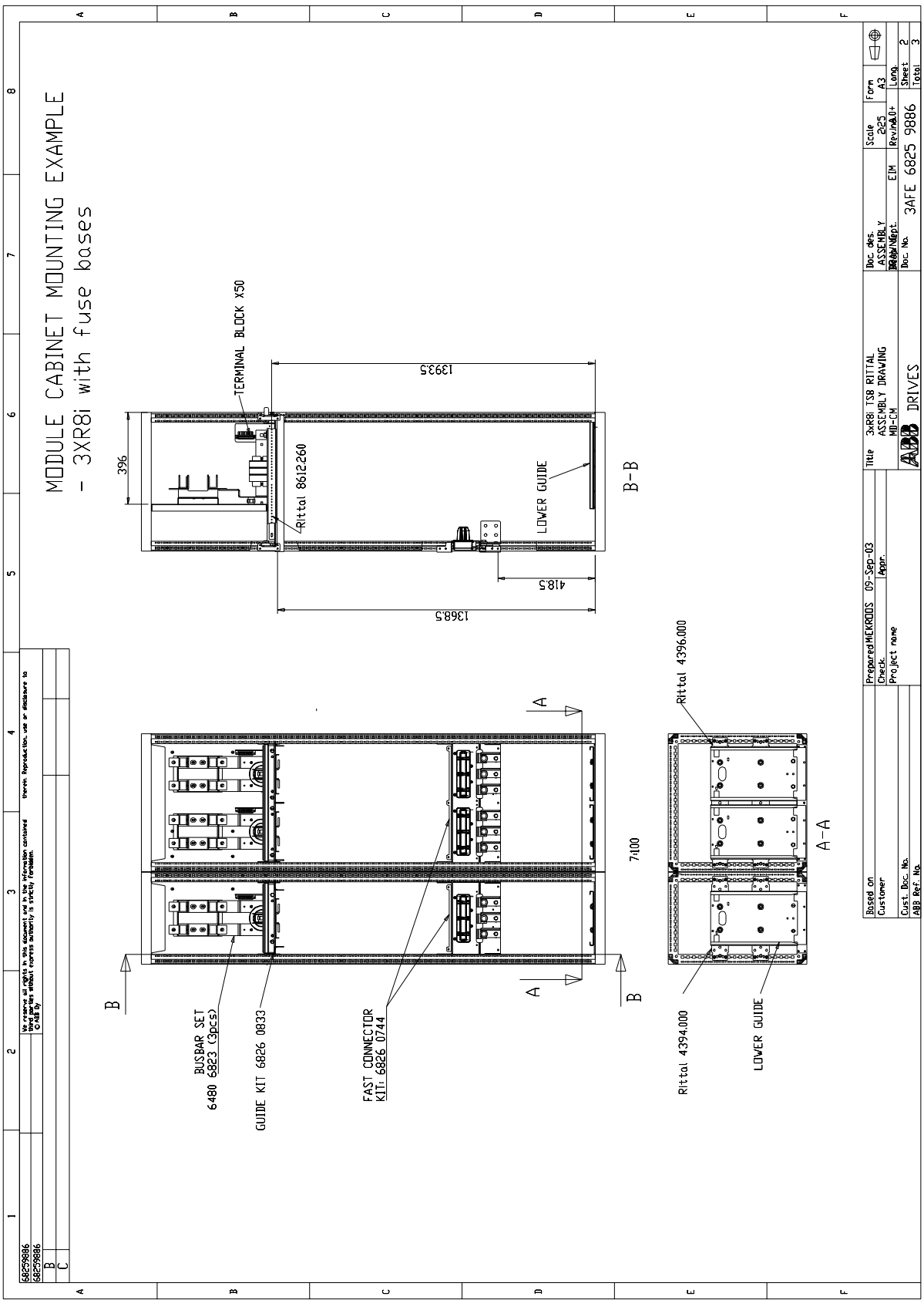
MODULE CABINET ASSEMBLY WITH SWITCH FUSE

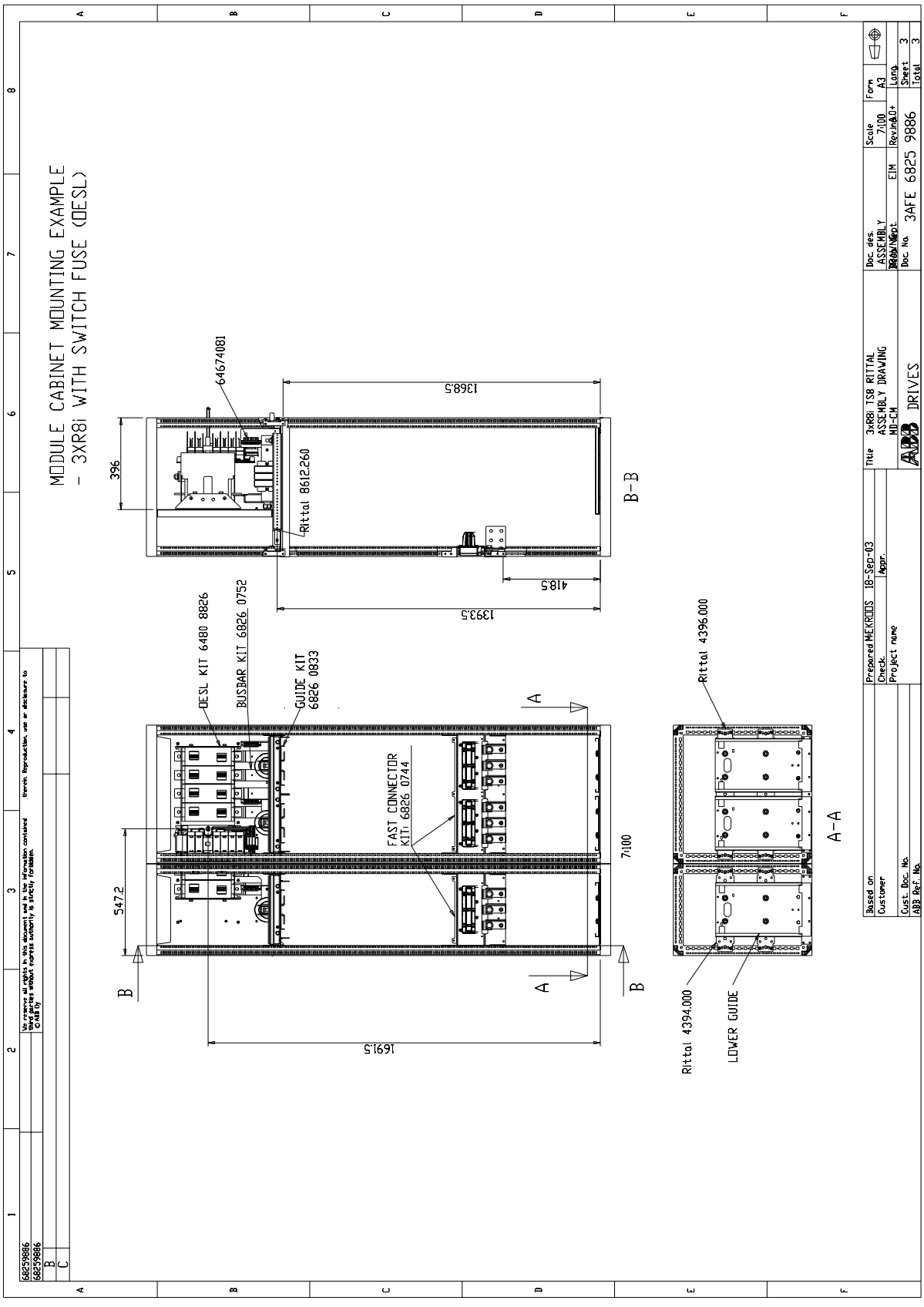
Based on Customer	Prepared M.EKROOS 09-Sep-03	Title MOUNTING INSTRUCTION RITTAL TS8 600 2xR8i MD-CM	Doc. des. ASSEMBLY DRAWING	Scale 9:100	Form A3	
	Check. - Appr. -		Resp. dept. EIM	Rev.ind. 4.0+	Lang.	EN
Cust. Doc. No.	Project name	ABB DRIVES	Doc. No. [illegible]		Sheet	4
ABB Ref. No.					Total	5


MODULE CABINET MOUNTING EXAMPLE
- Ventilation kit mounting
- Check air flow and sealing
ALLOW
AIR FLOW OUT
USE OPEN ROOF
AIRFLOW IN
NO AIRFLOW ALLOWED
ON THE SIDES / FRONT
OF UNIT BETWEEN BOTTOM
/ UPPER PARTS INSIDE
THE CABINET
DET.A
33:100
DET.A
OPTIONAL HOLE
FOR DESL HANDLE
Fastener
Attach with M5
screws (20 pcs)
Grille, inner
Filter mat
Grille, outer
7:100
MOUNTING INSTRUCTION
RITTAL TS8 600 2xR8i
MD-CM
DRIVES
3AFE 6824 2533

Three R8i modules in a Rittal TS 8 cabinet




MODULE CABINET MOUNTING EXAMPLE
- 3XR8i with fuse bases
TERMINAL BLOCK X50
1393.5
396
Rittal 8612260
LOWER GUIDE
B-B
418.5
1368.5
A
B
BUSBAR SET
6480 6823 (3pcs)
GUIDE KIT 6826 0833
FAST CONNECTOR
KIT: 6826 0744
7x100
Rittal 4396.000
Rittal 4394.000
LOWER GUIDE
A-A
3XR8i TSB RITTAL
ASSEMBLY DRAWING
MD-CM
DRIVES
3AFE 6825 9886
Scale 2:25
Form A3
Sheet 2
Total 3
Prepared MEKRODS 09-Sep-03
Check.
Appr.
Project name
Based on
Customer
Cust. Doc. No.
ABB Ref. No.


MODULE CABINET MOUNTING EXAMPLE
- 3XR8i WITH SWITCH FUSE (OESL)
64674081
1368.5
396
Rittal 8612.260
B-B
418.5
1393.5
OESL KIT 6480 8826
BUSBAR KIT 6826 0752
GUIDE KIT
6826 0833
FAST CONNECTOR
KIT 6826 0744
A
7:100
547.2
B
1691.5
Rittal 4396.000
A-A
Rittal 4394.000
LOWER GUIDE
Title 3xR8i IS8 RITTAL
ASSEMBLY DRAWING
MD-CM
Doc. des. ASSEMBLY
Doc No. 3AFE 6825 9886
Scale 7:100
Form A3
Sheet 3
Total 3
Prepared MEKRODS 18-Sep-03
Check. Appr.
Project name
Based on
Customer
Cust. Doc. No.
ABB Ref. No.
DRIVES
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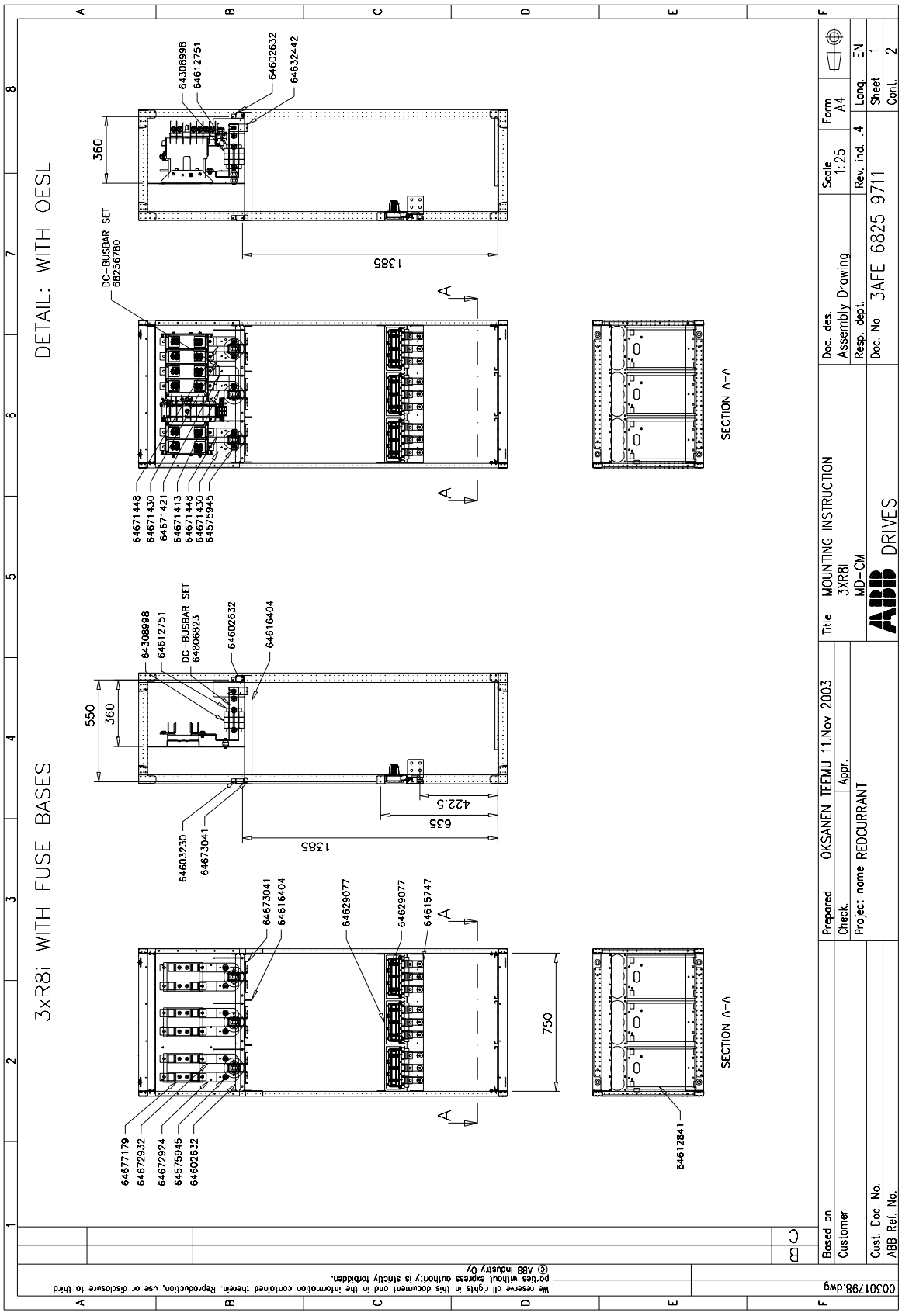
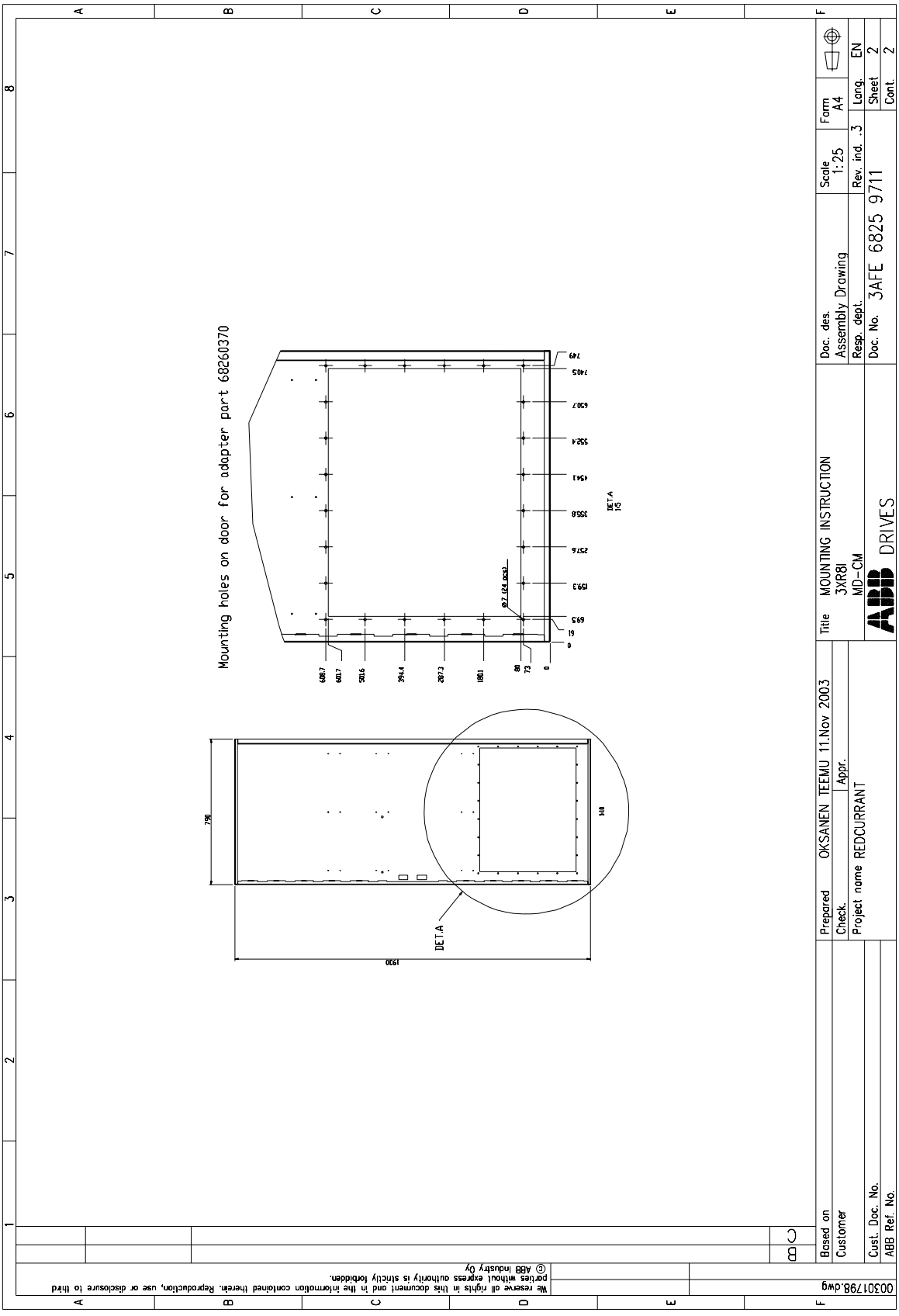
68259886

Three R8i modules side by side




Mounting holes on door for adapter part 68260370
DET.A
1930
790
910
Prepared OKSANEN TEEMU 11.Nov 2003
Check. Appr.
Project name REDCURRANT
Based on
Customer
Cust. Doc. No.
ABB Ref. No.
Title MOUNTING INSTRUCTION 3XR81 MD-CM
ABB DRIVES
Doc. des. Assembly Drawing
Resp. dept.
Doc. No. 3AFE 6825 9711
Scale 1:25
Rev. ind. .3
Form A4
Lang. EN
Sheet 2
Cont. 2
00307798.dwg
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Electrical installation

What this chapter contains

This chapter describes the electrical installation procedure of ACS800-104 inverter modules.

The wiring diagrams in this chapter are simplified presentations. See the chapter *Circuit diagrams* for details.

General

WARNING! Make sure that the drive system is disconnected from the mains (input power) during installation. If the drive system is already connected to the mains, wait for 5 min after disconnecting mains power. Measure the voltage between the L+ and L– terminals with a multimeter (impedance at least 1 Mohm) to ensure that the drive system is discharged before beginning work.

WARNING! Circuit boards contain components sensitive to electrostatic discharge (ESD). Wear an earthing wrist band when handling the boards. Do not touch the boards unnecessarily.

Notes on Optical Components

Handle fibre optic cables with care. When unplugging optic cables, always grab the connector, not the cable itself. Do not touch the ends of the fibres with bare hands as the fibre is extremely sensitive to dirt. The specifications of the optic cable are as follows:

- Storage temperature: -55 … +85 °C
- Installation temperature: -20 … +70 °C
- Maximum short-term tensile force: 50 N
- Minimum short-term bend radius: 25 mm
- Minimum long-term bend radius: 35 mm
- Maximum long-term tensile load: 1 N
- Flexing: Max. 1000 cycles

ABB drive products in general utilise 5 and 10 MBd (megabaud) optical components from Agilent Technologies' (Hewlett-Packard) Versatile Link range. Please note that the optical component type is not directly related to the actual communication speed.

Note: The optical components (transmitter and receiver) on a fibre optic link must be of the same type.

Plastic optical fibre (POF) cables can be used with both 5 MBd and 10 MBd optical components. 10 MBd components also enable the use of Hard Clad Silica (HCS®) cables, which allow longer connection distances thanks to their lower attenuation. HCS® cables cannot be used with 5 MBd optical components.

The maximum lengths of fibre optic links for POF and HCS® cables are 20 and 50 metres respectively.

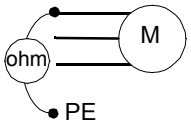
HCS® is a trademark of SpecTran Corporation.

Checking the insulation of the assembly

Every ACS800-104 inverter module has been tested for insulation between the main circuit and the chassis (2500 V rms 50 Hz for 1 second) at the factory. Therefore, do not make any voltage tolerance or insulation resistance tests (e.g. hi-pot or megger) on the inverter units or modules. Check the insulation of the assembly as follows.

WARNING! Check the insulation before connecting the drive to the main supply. Make sure that the drive is disconnected from the mains (input power).

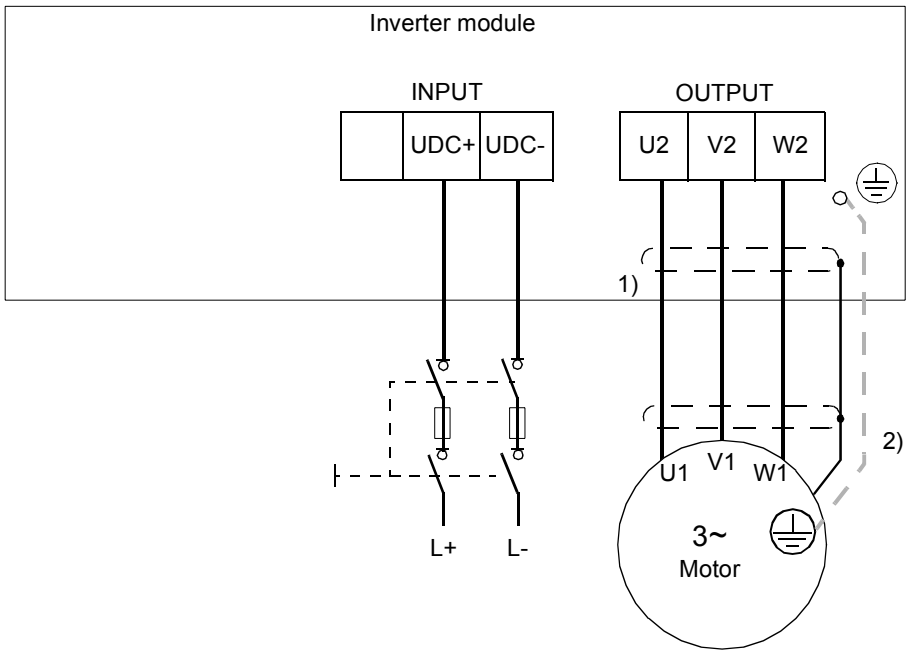
1. Check that the motor cable is disconnected from the drive output terminals U2, V2 and W2.



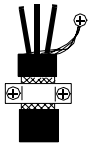
2. Measure the insulation resistances of the motor cable and the motor between each phase and the Protective Earth by using a measuring voltage of 1 kV DC. The insulation resistance must be higher than 1 Mohm.

Power connections – Frame R2i to R5i

Diagram



1) 360 degrees grounding



2) Use a separate grounding cable if the conductivity of the cable shield is less than 50% of the conductivity of the phase conductor in a cable with no symmetrically constructed grounding conductor (see the document *ACS 800 MultiDrive; Planning the Electrical Installation* [3AFE 64783742, English]).

Note:

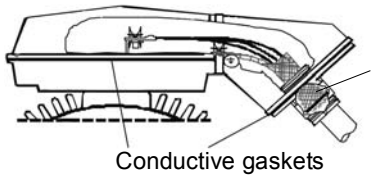
If there is a symmetrically constructed grounding conductor in the motor cable in addition to the conductive shield, connect the grounding conductor to the grounding terminal at the drive and motor ends.

Do not use an asymmetrically constructed motor cable. Connecting its fourth conductor at the motor end increases bearing currents and causes extra wear.

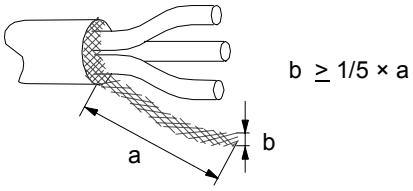
Grounding of the motor cable shield at the motor end

For minimum radio frequency interference:

- ground the cable shield 360 degrees at the lead-through of the motor terminal box



- or ground the cable by twisting the shield as follows: flattened width ≥ 1/5 × length.



Conductor stripping lengths

Strip the conductor ends as follows to fit them inside the power cable connection terminals.

Frame size	Stripping length	
	mm	in.
R2i, R3i	10	0.39
R4i, R5i	16	0.63

Connection box kit

The inverter module is supplied with a connection box kit containing the following items:

- back plate
- cover
- 3 clamps
- lug terminals (frame sizes R2i and R3i only)
- screws.

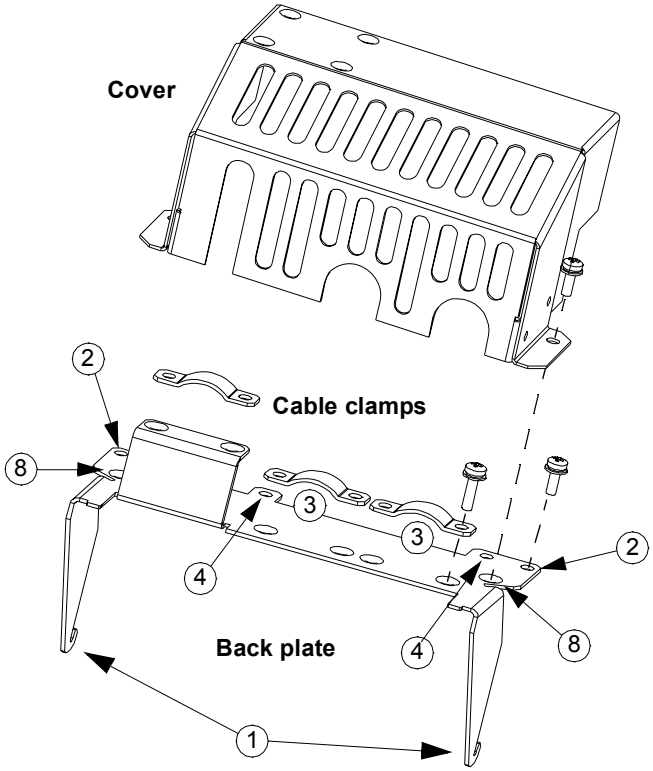
The kit also contains a shroud for covering the relay outputs of the RMIO board.

Cable connection procedure

Refer to the diagram below.

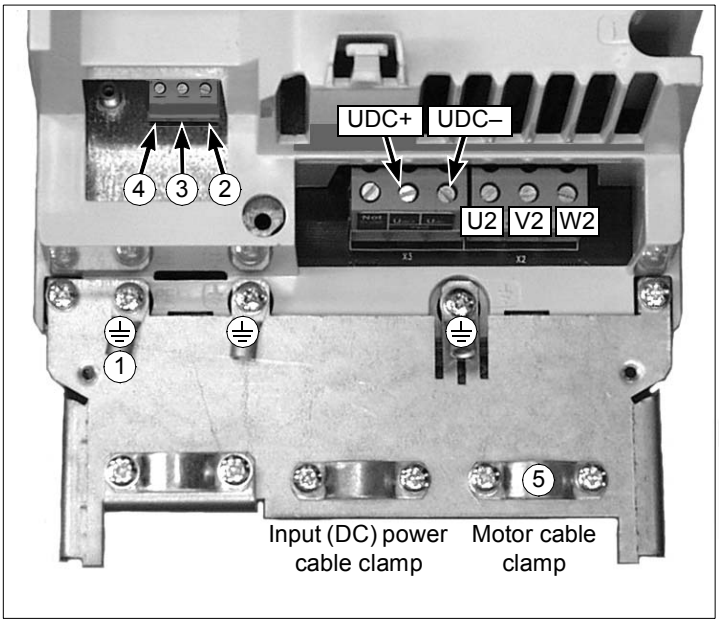
1. Insert the hooks of the connection box back plate to the two corresponding slots in the bottom plate of the inverter module.
2. Fasten the back plate to the module frame with two screws.
3. Strip off the plastic sheaths of the input (DC) cable (if of shielded type) and motor cables under the cable clamps. Fasten the clamps onto the stripped part of the cable.
4. (Frame sizes R2i and R3i) Crimp a lug terminal (supplied in the connection box kit) onto the twisted shields of the cables.

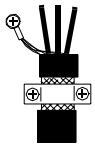
   (All frame sizes) Connect the shields to the grounding terminals.
5. Connect the conductors of the input (DC) cable to the UDC+ and UDC– terminals and the phase conductors of the motor cable to the U2, V2 and W2 terminals.
6. Secure the cables outside the unit mechanically.
7. Connect the control cables as described in section *Control connections*.
8. Fasten the cover to the back plate with two screws.



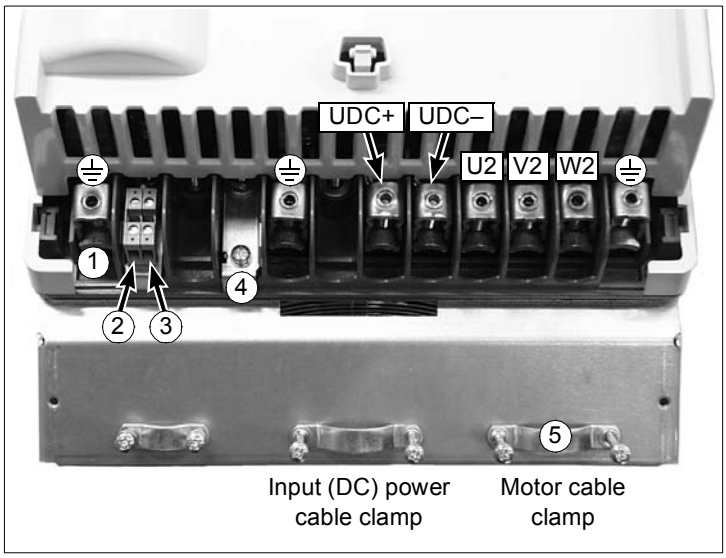
Frame R2i to R4i power connections

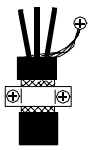
Frame R3i pictured.



Item No.	Information
1	Connect to PE busbar of cabinet.
2…4	Prevention of unexpected start (optional). See also the chapter *Circuit diagrams*.
2	**L** (95…265 V AC). Voltage must be ON for the inverter to start.
3	**N**
4	**PE**
5	Strip off the outer sheathing of the cable at the clamp. 

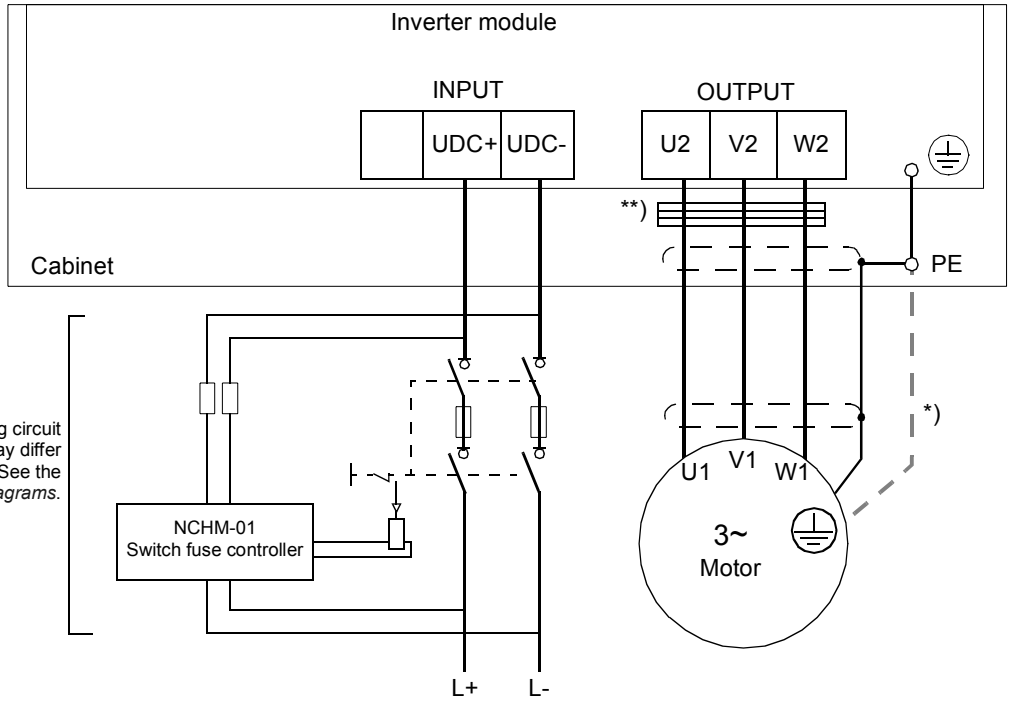
Frame R5i power connections



Item No.	Information
1	Connect to PE busbar of cabinet.
2…4	Prevention of unexpected start (optional). See also the chapter *Circuit diagrams*.
2	**L** (95…265 V AC). Voltage must be ON for the inverter to start.
3	**N**
4	**PE**
5	Strip off the outer sheathing of the cable at the clamp. 

Power connections – Frames R6i and R7i

Diagram



Note: Charging circuit configuration may differ from type to type. See the chapter *Circuit diagrams*.

*Use a separate grounding cable if the conductivity of the cable shield is less than 50% of the conductivity of the phase conductor in a cable with no symmetrically constructed grounding conductor (see the document *ACS 800 MultiDrive; Planning the Electrical Installation* [3AFE 64783742, English]).

Note:

If there is a symmetrically constructed grounding conductor in the motor cable in addition to the conductive shield, connect the grounding conductor to the grounding terminal at the drive and motor ends.

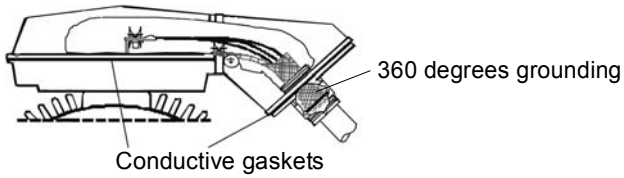
Do not use an asymmetrically constructed motor cable. Connecting its fourth conductor at the motor end increases bearing currents and causes extra wear.

**Common mode filtering (optional)

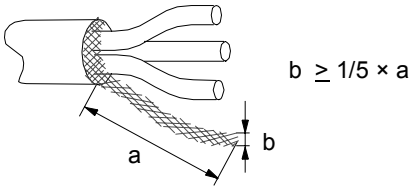
Grounding of the motor cable shield at the motor end

For minimum radio frequency interference:

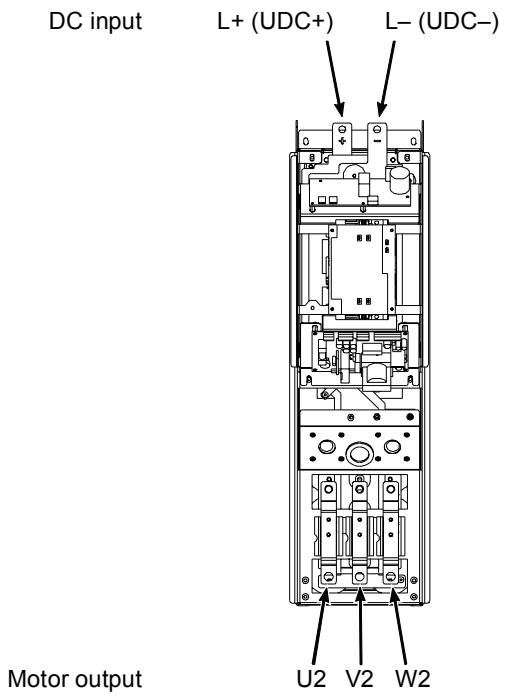
- ground the cable shield 360 degrees at the lead-through of the motor terminal box



- or ground the cable by twisting the shield as follows: flattened width ≥ 1/5 × length.



DC and motor connections



Charging circuit

Installing a switch fuse between the inverter module(s) and the DC link necessitates a charging circuit. In frame R6i units, the charging circuit consists of charging resistors and a contactor; with R7i, the charging is monitored by a charging controller unit (type NCHM-x1C). The main components of the charging circuit (apart from the fuses and fuse bases) are included in the switch fuse kits.

For frame R6i, the minimum wire sizes to be used in the charging circuit are as follows:

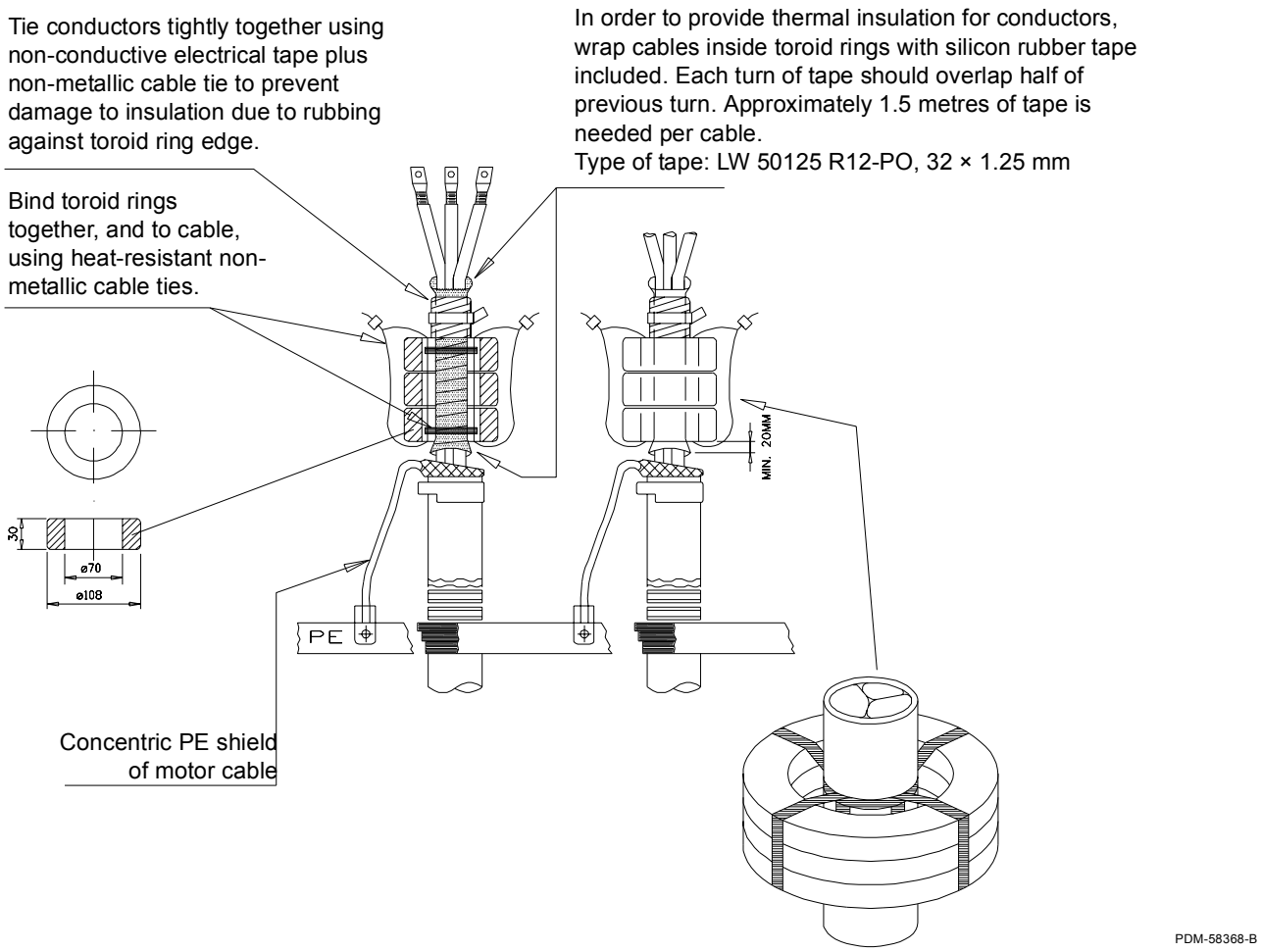
- From contactor to resistors; between resistors (690 V units): 2.5 mm^2 (AWG 14)
- Charging control (wiring to/from NPOW): 0.75 mm^2 (AWG 18).

For frame R7i, the minimum wire sizes to be used in the charging circuit are as follows:

- DC bus to fuses: 2.5 mm^2 (AWG 14), **double-insulated**
- NCHM to ground: 2.5 mm^2 (AWG 14)
- From fuses/NCHM to charging resistors: 1.5 mm^2 (AWG 14)
- Switch fuse auxiliary contact/solenoid wiring; auxiliary voltage supply to NCHM: 0.75 mm^2 (AWG 18).

Installation of common mode filters

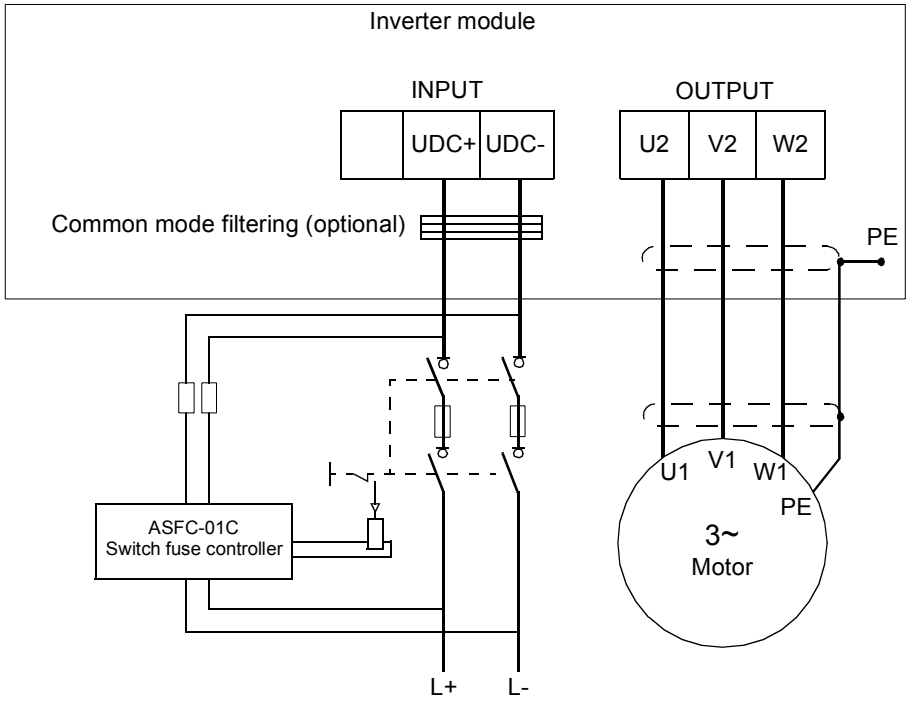
The following diagram shows how the common mode filter (consisting of three toroidal cores) is installed on the output cable.


Tie conductors tightly together using non-conductive electrical tape plus non-metallic cable tie to prevent damage to insulation due to rubbing against toroid ring edge.
In order to provide thermal insulation for conductors, wrap cables inside toroid rings with silicon rubber tape included. Each turn of tape should overlap half of previous turn. Approximately 1.5 metres of tape is needed per cable.
Type of tape: LW 50125 R12-PO, 32 × 1.25 mm
Bind toroid rings together, and to cable, using heat-resistant non-metallic cable ties.
30
ø70
ø108
MIN. 20MM
PE
Concentric PE shield of motor cable
PDM-58368-B

Power connections – Frame R8i and multiples

See also the document *ACS800 MultiDrive; Planning the Electrical Installation* (3AFE 64783742 [English]).

Wiring diagram



DC connection

The DC connection busbars are located at the top of the module. See the dimensional diagrams for the exact location. Busbar sets for the DC connection with holders for common mode filter toroids are available, and pictured in the chapter *Cabinet construction*.

WARNING! Make sure the M12 screws used for connecting the DC link to the inverter module do not extend into the module farther than 20 mm.

Charging circuit

Installing a switch fuse between the inverter module(s) and the DC link necessitates a charging circuit. The charging circuit contains two resistors per inverter module and a switch fuse controller (type ASFC-01C). The resistors and the controller are included in the switch fuse kits.

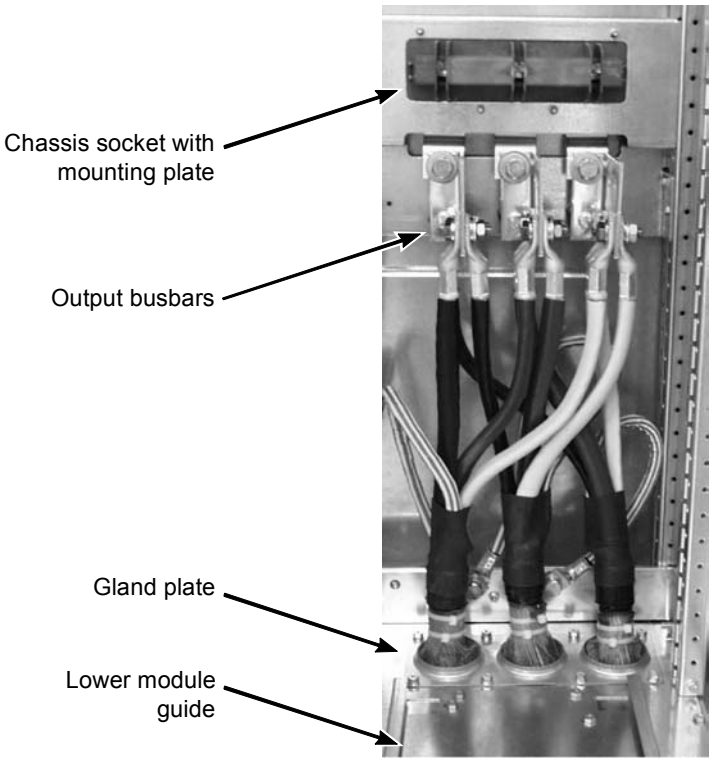
The minimum wire sizes to be used in the charging circuit are as follows:

- DC bus to fuses: 2.5 mm^2 (AWG 14), **double-insulated**
- ASFC to ground: 2.5 mm^2 (AWG 14)
- From fuses/ASFC to charging resistors: 1.5 mm^2 (AWG 14)
- Switch fuse auxiliary contact/solenoid wiring; auxiliary voltage supply to ASFC: 0.75 mm^2 (AWG 18).

The ASFC is also to be connected to the AINT board of the inverter module(s) by a fibre optic link. See this chapter under *Control connections*.

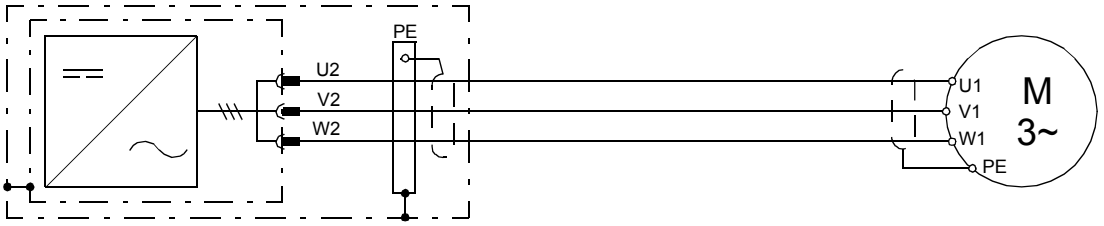
Motor connection

The motor connection of frame R8i inverter modules is located at the back of the module so that a quick connector can be used, enabling easy extraction of the module from the cabinet for maintenance. The chassis socket – available separately with different mounting parts – is attached to the rear part of the cubicle (see the examples in the chapter *Cabinet construction*). The picture below shows a cabling example.



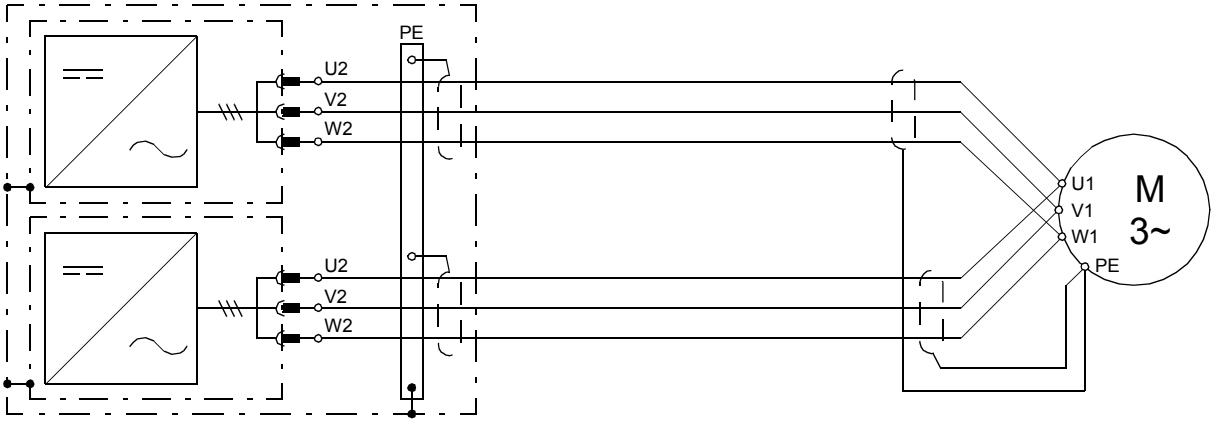
Direct motor cabling

The diagram below shows the connection of the motor when the inverter unit consists of one inverter module only.



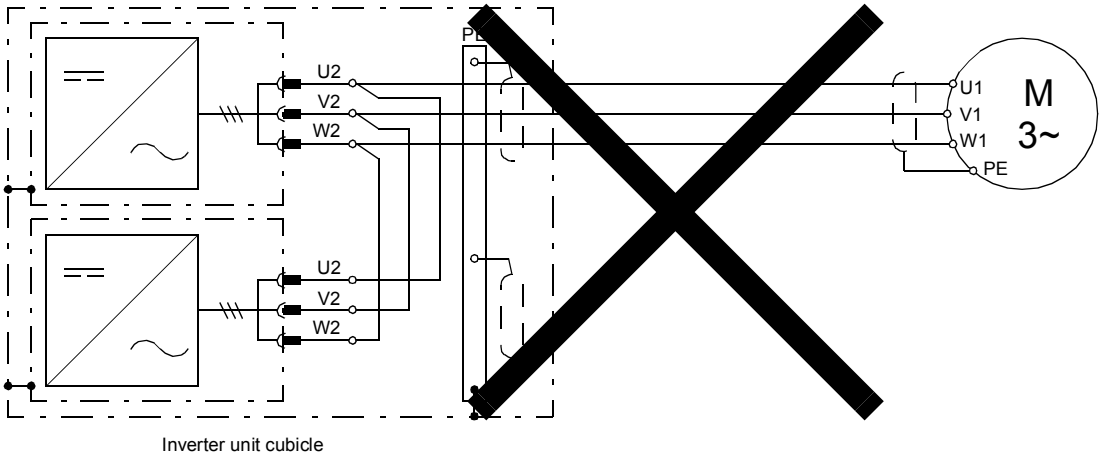
Inverter unit cubicle

If a common motor terminal cubicle is not used, all the inverter modules in a parallel configuration (2×R8i, 3×R8i, etc.) are to be cabled separately to the motor as shown in the diagram below.

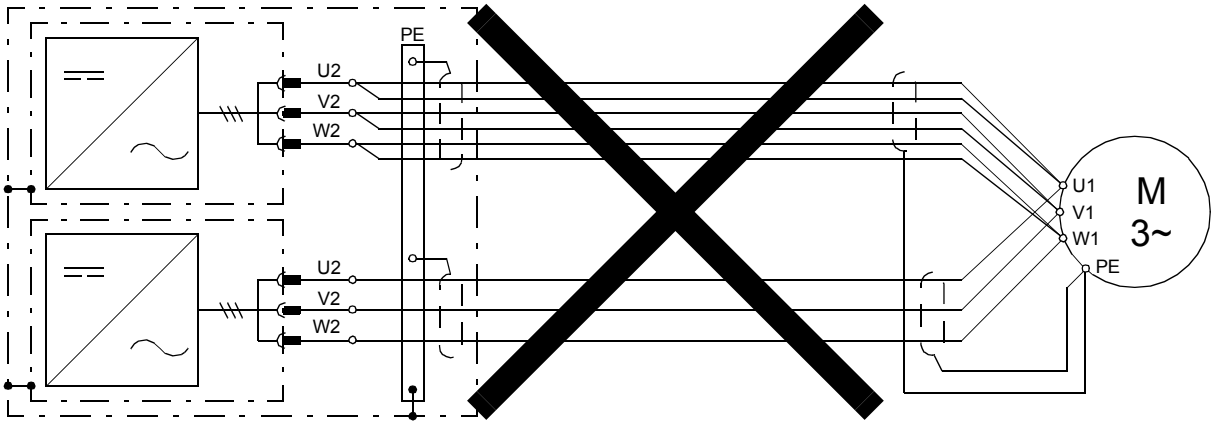


Inverter unit cubicle

WARNING! The cabling from all inverter modules to the motor must be physically identical considering cable type, cross-sectional area, and length. For example, “jumpering” the cables from one inverter module to another (and then to the motor) is not allowed.



Inverter unit cubicle



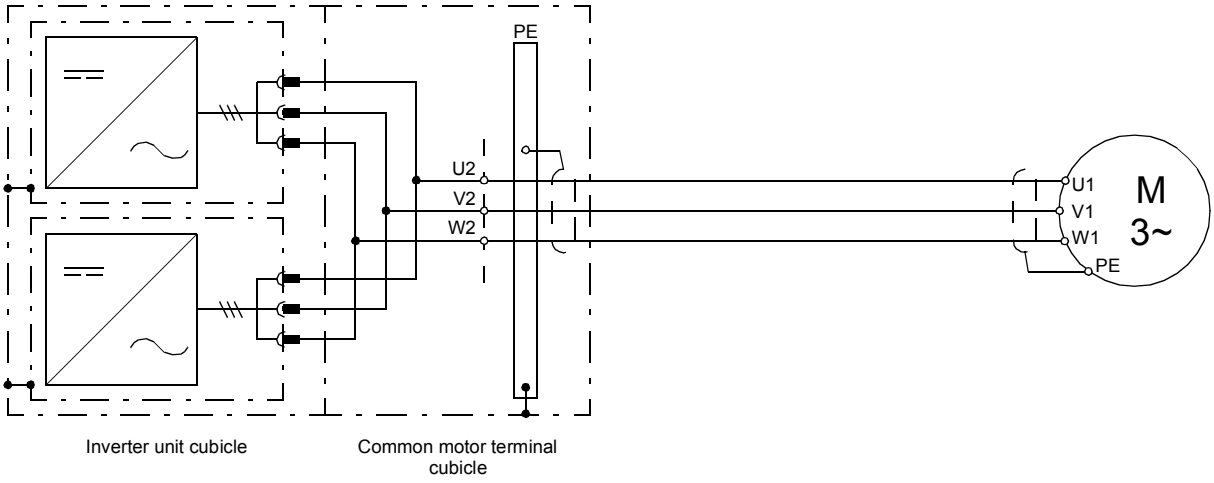
Inverter unit cubicle

Common motor terminal cubicle

Instead of direct cabling from each inverter module to the motor, it is also possible to build a common motor terminal cubicle.

WARNING! If a common motor terminal cubicle is constructed, the inverter modules must be equipped with the **+E205** option (internal du/dt filters).

Note that the distance from both modules to the common output should be of roughly equal length.

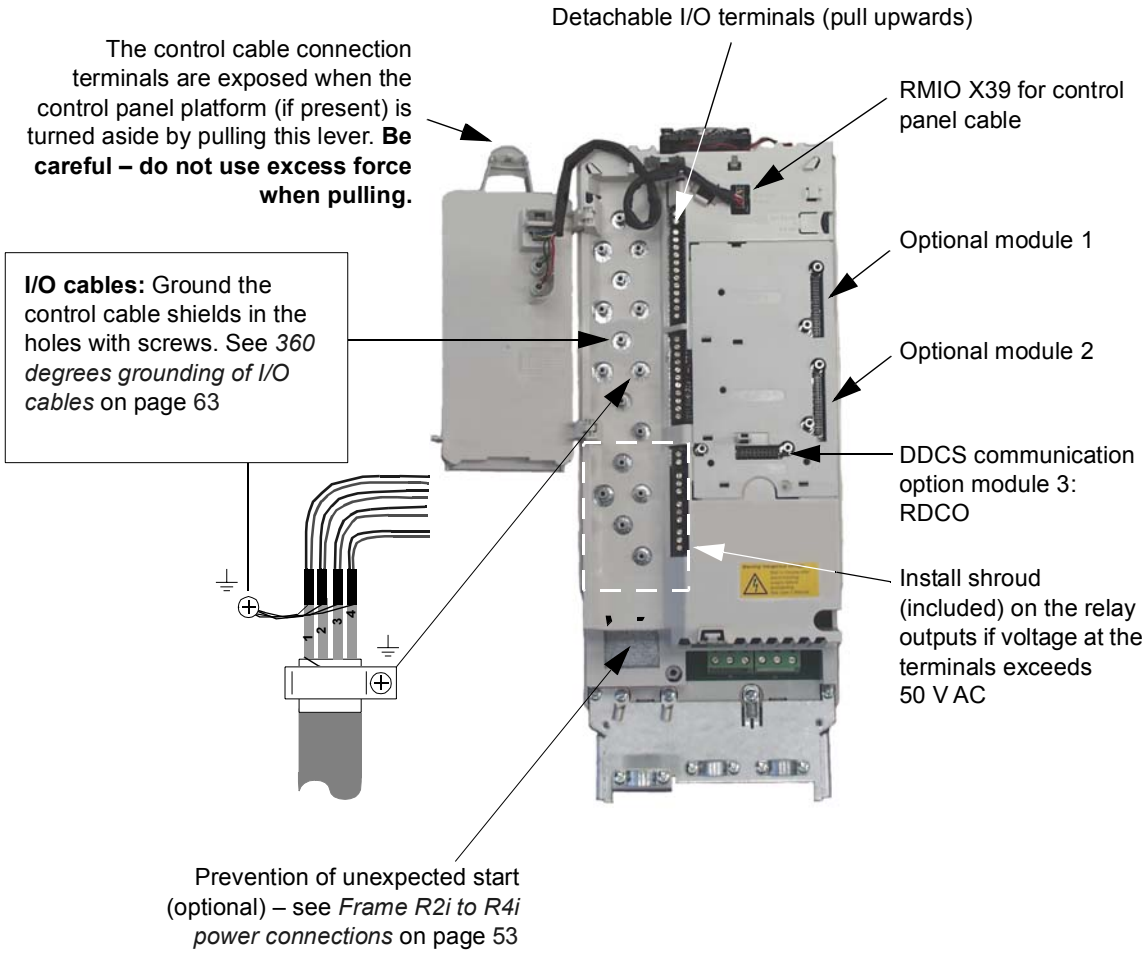


Control connections

Frame R2i to R5i

These inverter modules have a built-in RMIO (Motor control and I/O) board. For descriptions of the terminals, see the chapter *Motor control and I/O board (RMIO)*.

Frame R2i to R4i (R3i pictured)


Detachable I/O terminals (pull upwards)
The control cable connection terminals are exposed when the control panel platform (if present) is turned aside by pulling this lever. **Be careful – do not use excess force when pulling.**
RMIO X39 for control panel cable
Optional module 1
I/O cables: Ground the control cable shields in the holes with screws. See *360 degrees grounding of I/O cables* on page 63
Optional module 2
DDCS communication option module 3: RDCO
Install shroud (included) on the relay outputs if voltage at the terminals exceeds 50 V AC
Prevention of unexpected start (optional) – see *Frame R2i to R4i power connections* on page 53

Frame R5i

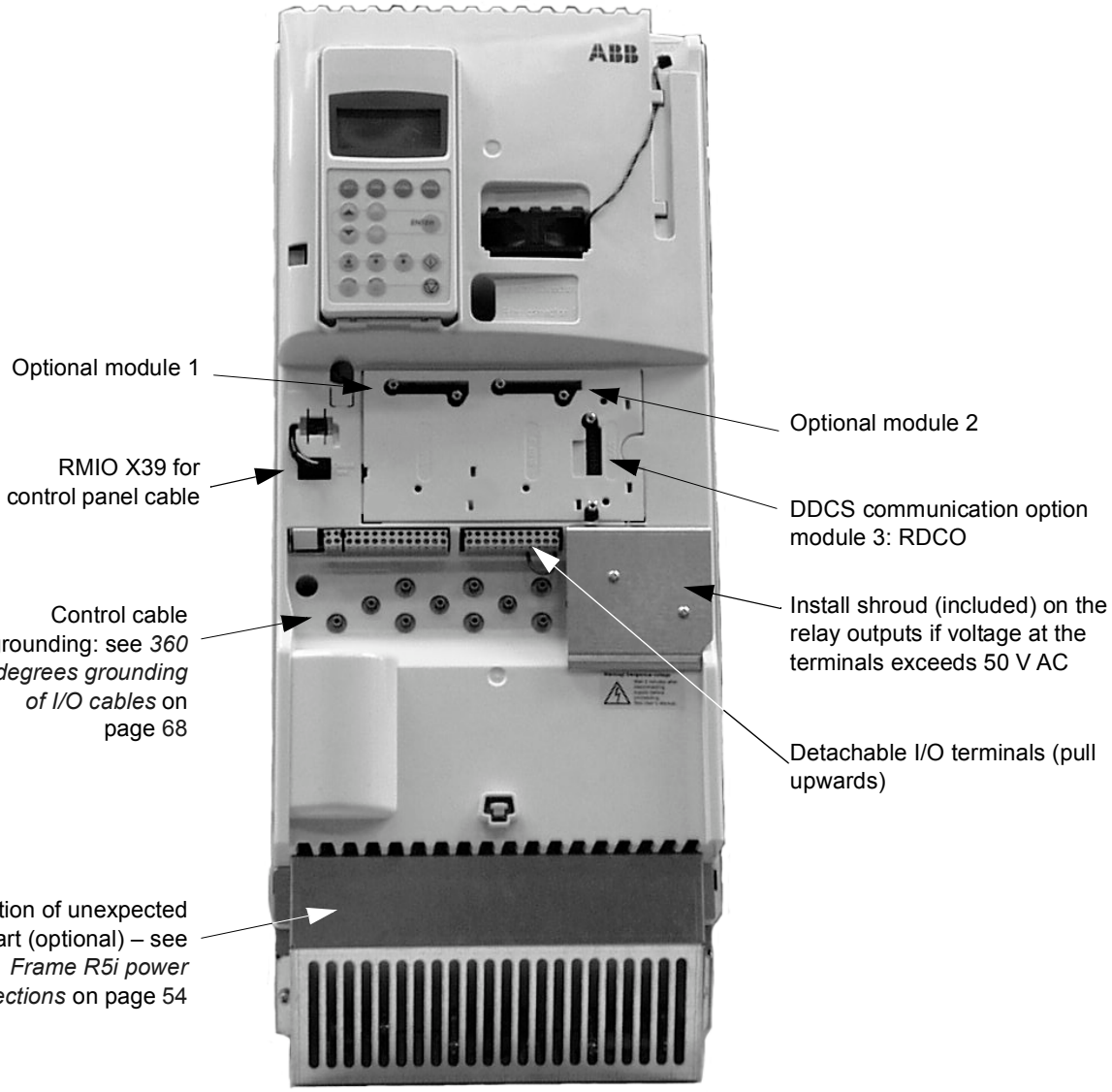


ABB
Optional module 1
RMIO X39 for control panel cable
Control cable grounding: see *360 degrees grounding of I/O cables* on page 68
Prevention of unexpected start (optional) – see *Frame R5i power connections* on page 54
Optional module 2
DDCS communication option module 3: RDCO
Install shroud (included) on the relay outputs if voltage at the terminals exceeds 50 V AC
Detachable I/O terminals (pull upwards)

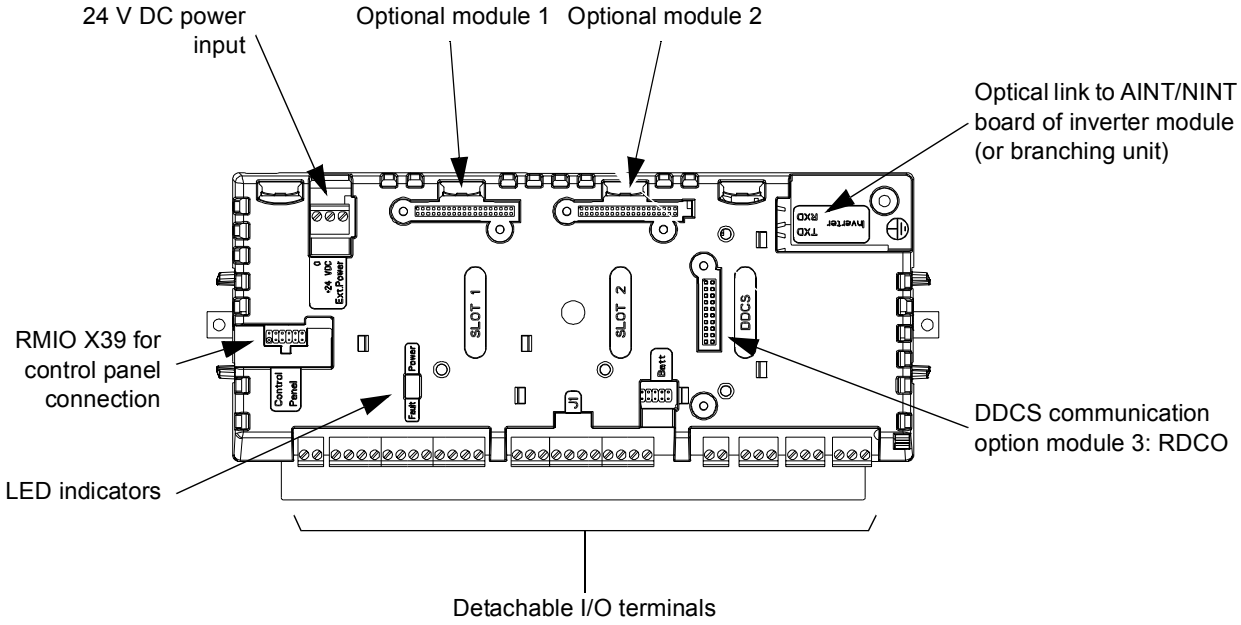
External +24 V power supply for the RMIO board

The RMIO board of the inverter module can be powered from an external 24 V DC supply. This is practical if the board needs to be kept live even if the main power to the drive is off. The 24 V supply can be fed by a UPS if necessary.

Refer to chapter *External +24 V power supply for the RMIO board*, starting on page 75.

Frame R6i, R7i, R8i and multiples

Inverter units consisting of frame R6i, R7i and R8i inverter modules employ a separate control unit, RDCU-02C, containing the RMIO board. For the terminals of the RMIO board, see the chapter *Motor control and I/O board (RMIO)*. For further information on the RDCU-02C, see the document *RDCU-02(C) Drive Control Unit Hardware Manual* (3AFE 64636324 [English]).



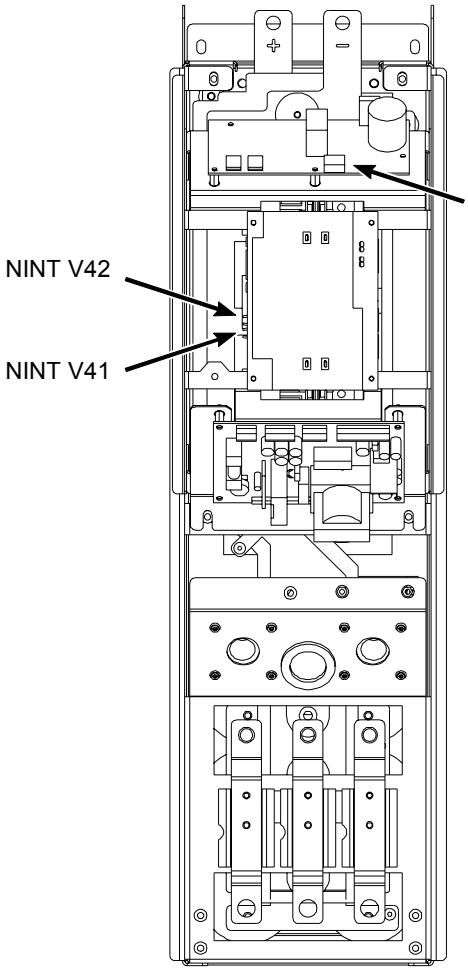
A fibre optic link is used to connect the RDCU to the NINT (R6i/R7i) or AINT (R8i) board in the inverter module. In case of parallel-connected inverter modules, a PPCS branching unit (type NPBU or APBU) distributes the optical control link to all the modules.

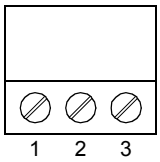
The switch fuse controller board (ASFC), used in conjunction with R8i modules, also connects to the AINT board of each inverter module through a fibre optic link.

The connections between the control unit, branching unit (if present), switch fuse controller and the inverter module are shown in the chapter *Circuit diagrams*.

R6i/R7i connectors

The following picture shows the fibre optic connectors V41 and V42 on the NINT board as well as the NGPS connection (optional).

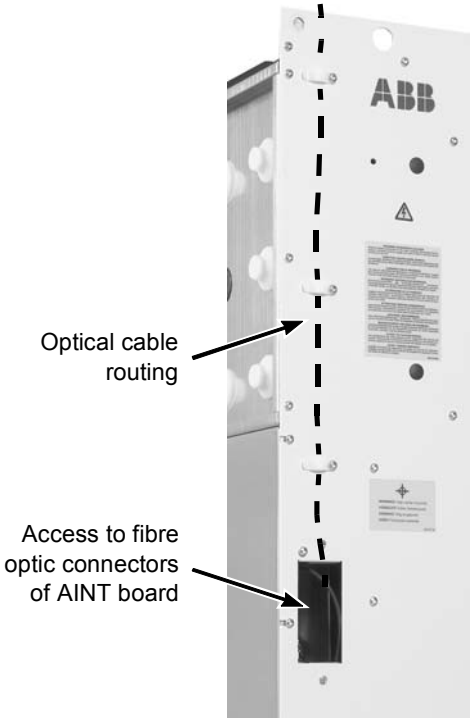




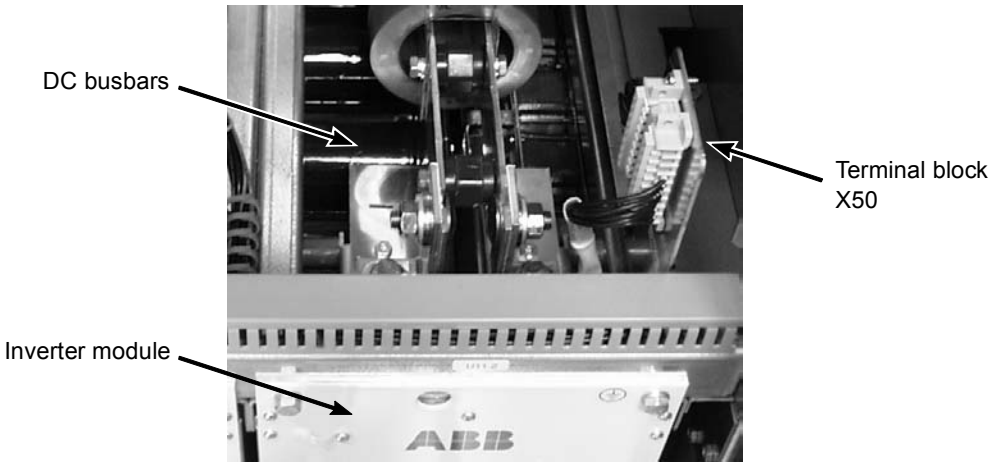
Terminal no.	Information
1…3	Prevention of unexpected start (optional). See also the chapter *Circuit diagrams*.
1	**PE**
2	**N**
3	**L** (95…265 V AC). Voltage must be ON for the inverter to start.

R8i connectors

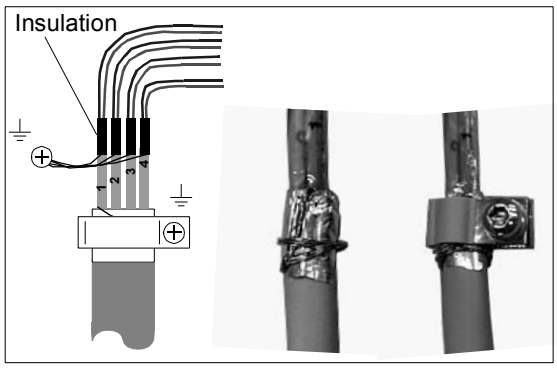
The fibre optic connectors (for connections to both the RDCU and the ASFC boards) on the AINT board of the inverter module are accessible through an opening on the front.



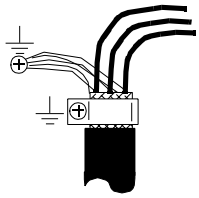
If the inverter module is equipped with the Prevention of unexpected start option (**+Q950**), or not equipped with a speed-controlled fan (option **+C126**), the necessary connections are made via a detachable terminal block (X50). The counterpart – included in the delivery – can be installed near the top of the module. In the picture below, the terminal block is installed on the mounting plate on the upper guide of the module.



360 degrees grounding of I/O cables



Double shielded cable



Single shielded cable

When the outer surface of the shield is covered with non-conductive material

- Strip the cable carefully (do not cut the grounding wire and the shield)
- Turn the shield inside out to expose the conductive surface.
- Wrap the grounding wire around the conductive surface.
- Slide a conductive clamp onto the conductive part.
- Fasten the clamp to the grounding plate with a screw as close as possible to the terminals where the wires are about to be connected.

Connecting the shield wires

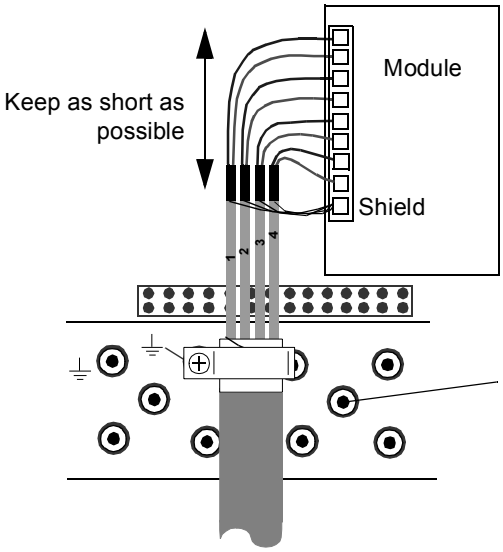
Single shielded cables: Twist the grounding wires of the outer shield and connect them through the shortest possible route to the nearest grounding hole with a cable lug and a screw. Double shielded cables: Connect each pair cable shield (twisted grounding wires) with other pair cable shields of the same cable to the nearest grounding hole with a cable lug and a screw.

Do not connect shields of different cables to the same cable lug and grounding screw.

Leave the other end of the shield unconnected or ground it indirectly via a few nanofarads high-frequency capacitor (e.g. 3.3 nF / 630 V). The shield can also be grounded directly at both ends if they are *in the same ground line* with no significant voltage drop between the end points.

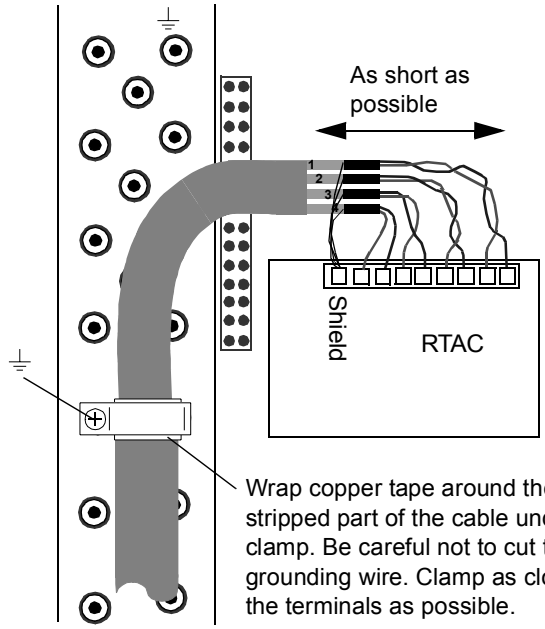
Keep the signal wire pairs twisted as close to the terminals as possible. Twisting the wire with its return wire reduces disturbances caused by inductive coupling.

Cabling of I/O and fieldbus modules



Note: The RDIO module does not include a terminal for cable shield grounding. Ground the pair cable shields here.

Pulse encoder module cabling



Wrap copper tape around the stripped part of the cable under the clamp. Be careful not to cut the grounding wire. Clamp as close to the terminals as possible.

Note 1: If the encoder is of unisolated type, ground the encoder cable at the drive end only. If the encoder is galvanically isolated from the motor shaft and the stator frame, ground the encoder cable shield at the drive and the encoder end.

Note 2: Twist the pair cable wires.

Installation of optional modules and PC

Optional modules (such as fieldbus adapters, I/O extension modules and the pulse encoder interface) are inserted in the optional module slot of the RMIO board and fixed with two screws. See the appropriate optional module manual for cable connections.

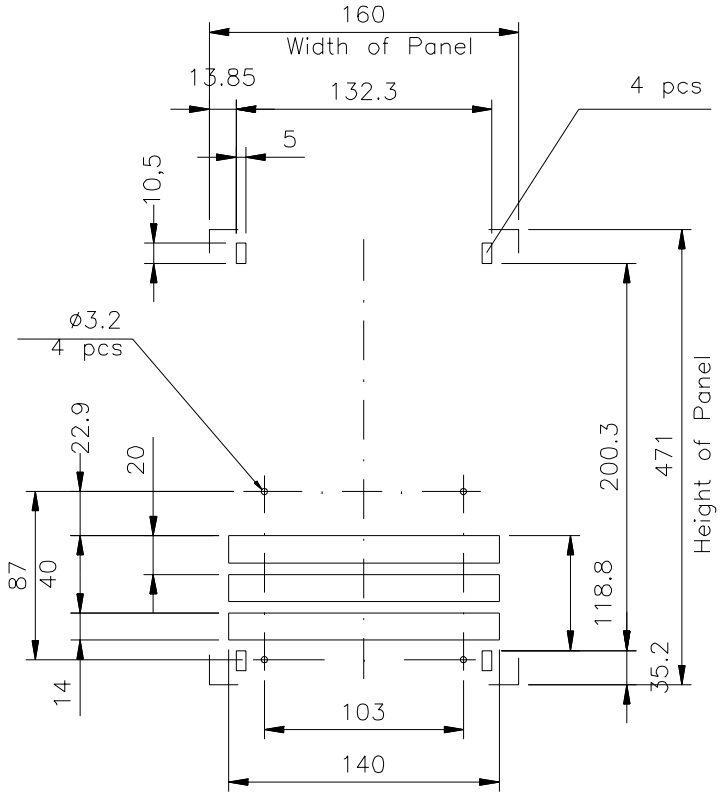
Fibre optic links

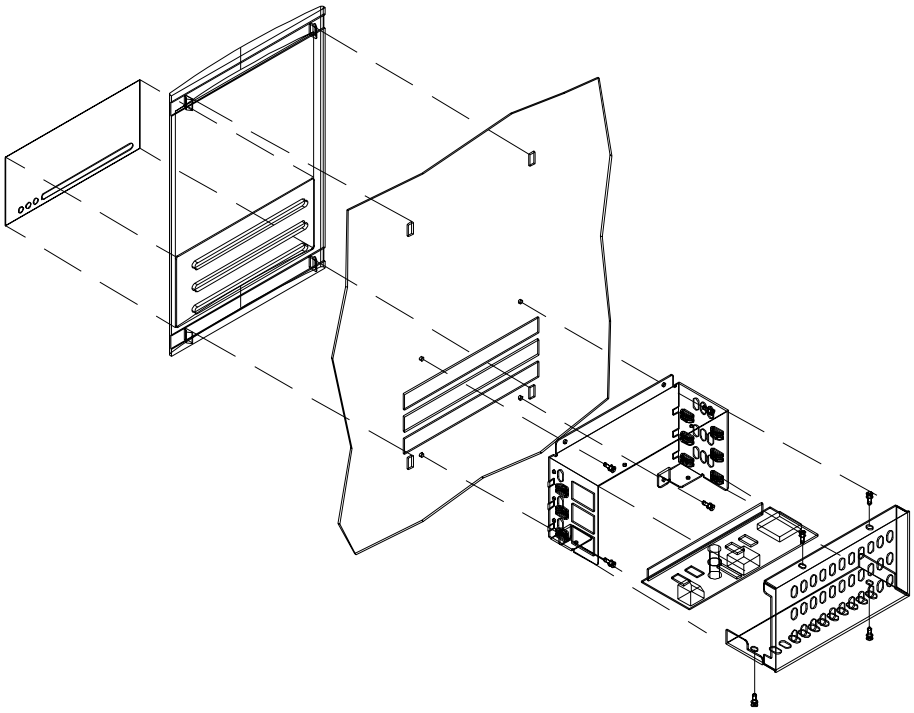
DDCS fibre optic links are provided by the RDCO module (optional) for PC tools, master/follower link, NDIO, NTAC, NAIO and fieldbus adapter modules of type Nxxx. See *RDCO User's Manual* for the connections. Observe colour coding when installing fibre optic cables: blue connectors go to blue terminals, and grey connectors to grey terminals.

When installing multiple modules on the same channel, connect them in a ring.

Installation of NLMD-01 LED Monitoring Display

Mechanical installation





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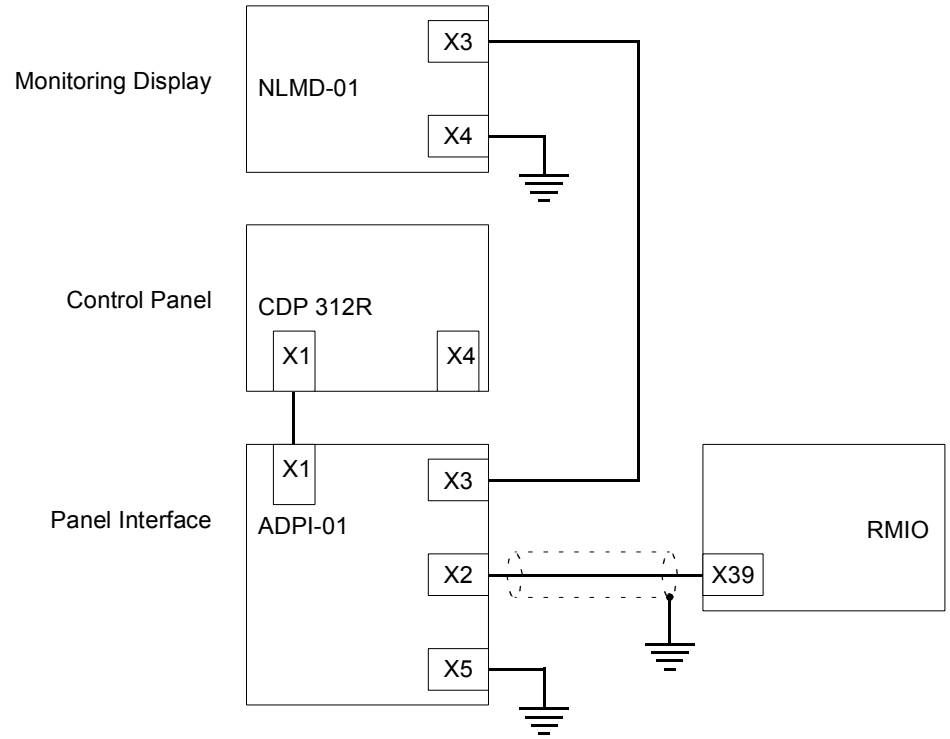
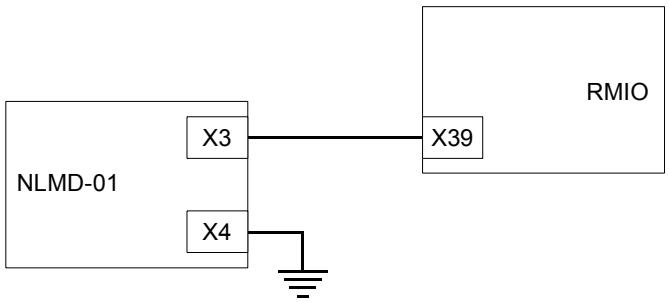
Wiring

Control panel with monitoring display

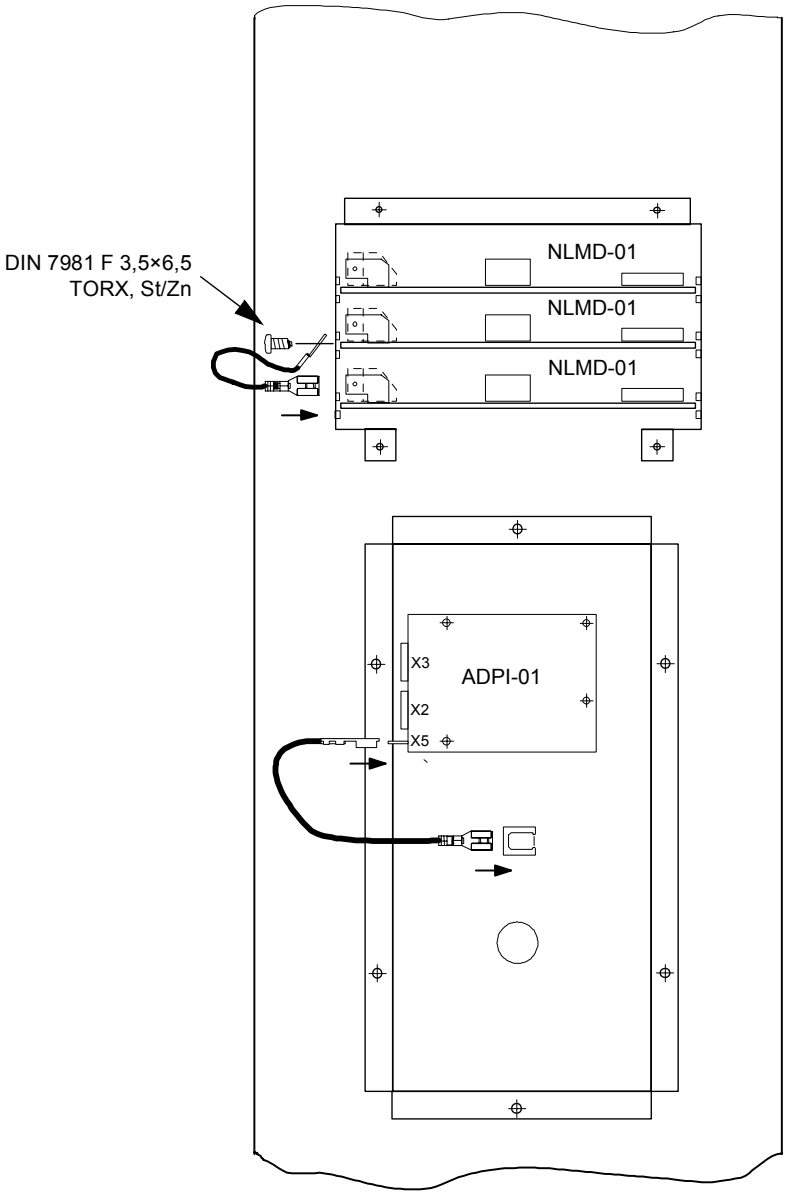


Monitoring display only



Earthing

Each NLMD-01 board is to be individually earthed. The earthing wires are included in the control panel platform and LED display kits.



External +24 V power supply for the RMIO board

What this chapter contains

This chapter describes how to connect external +24 V power supply for the RMIO board.

When to use

External +24 V power supply for the RMIO board is recommended if

- the application requires fast start after connecting the input power supply
- fieldbus communication is required when the input power supply is disconnected.

For current consumption of the RMIO board, see chapter *Motor Control and I/O Board (RMIO)*.

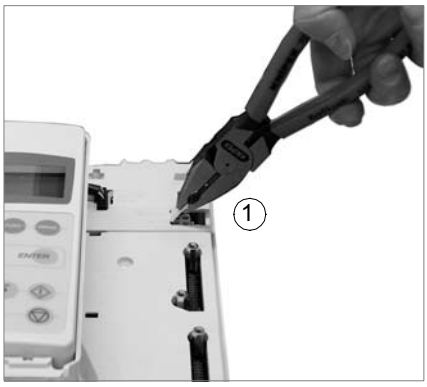
Parameter settings

In Standard Application Program, set parameter 16.9 CTRL BOARD SUPPLY to EXTERNAL 24V if the RMIO board is powered from an external supply.

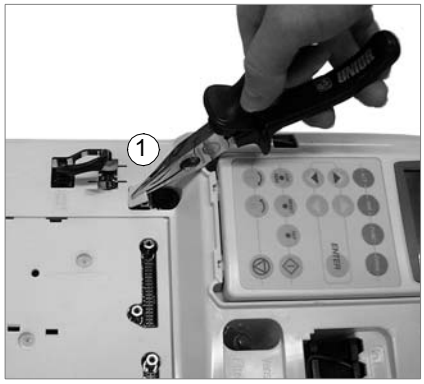
Connecting +24 V external power supply

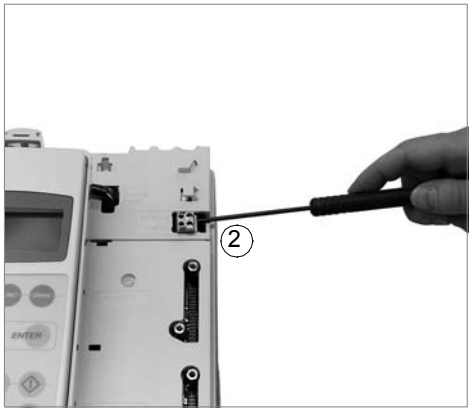
1. Break off the tab covering the +24 VDC power input connector with pliers.
2. Lift the connector upwards.
3. Disconnect the wires from the connector (keep the connector for later use).
4. Isolate the ends of the wires individually with insulating tape.
5. Cover the isolated ends of the wires with insulating tape.
6. Push the wires inside the skeleton.
7. Connect the wires of the +24 V external power supply to the disconnected connector: + wire to terminal 1 and - wire to terminal 2.
8. Plug the connector in.

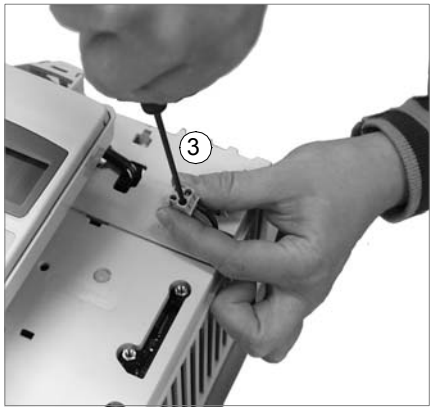
Frame sizes R2i to R4i

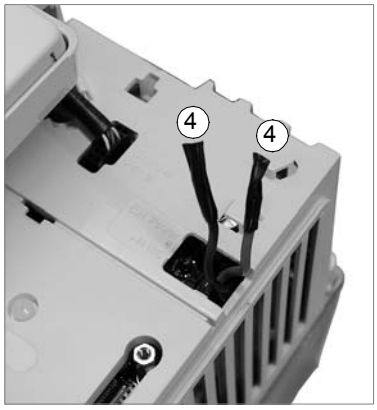


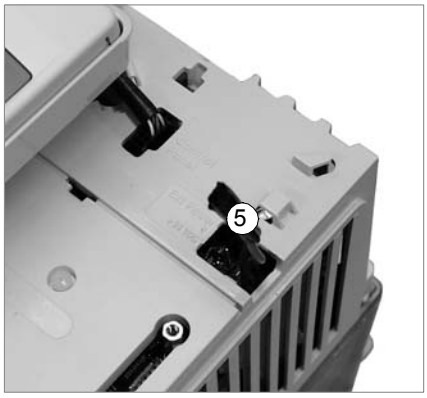
Frame sizes R5i







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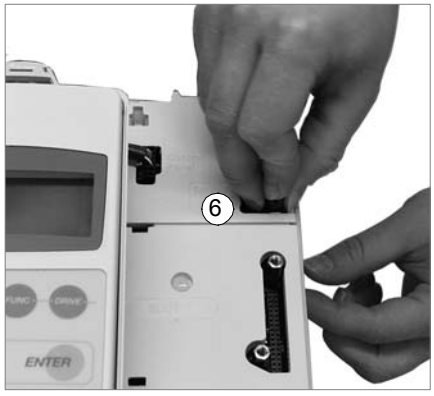
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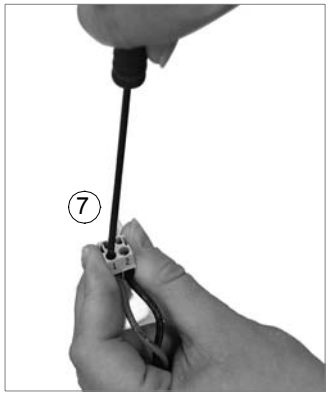
ENTER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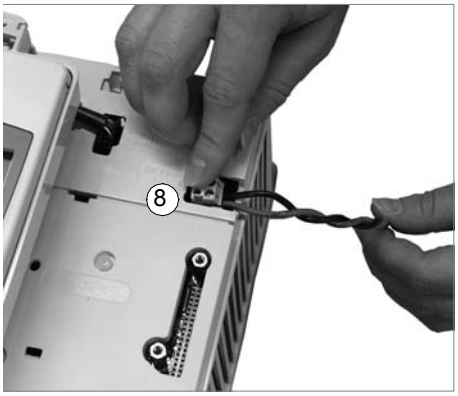

8

Installation checklist

Checklist

Check the mechanical and electrical installation of the drive before start-up. Go through the checklist below together with another person.

	Check
MECHANICAL INSTALLATION	
☐	The ambient operating conditions are allowed. (See *Technical data*.)
☐	The unit is properly fastened on a non-flammable base. (See *Cabinet construction*, and separate document *ACS 800 MultiDrive Modules; Planning the Cabinet Installation* [3AFE 64783531, English])
☐	The cooling air is able to flow freely.
☐	The motor and the driven equipment are ready for start. (See *Technical data: Motor connection*, and separate document *ACS 800 MultiDrive; Planning the Electrical Installation* [3AFE 64783742, English])
ELECTRICAL INSTALLATION (See *Electrical installation*, and separate document *ACS 800 MultiDrive Modules; Planning the Cabinet Installation* [3AFE 64783531, English])	
☐	The capacitors are reformed if stored over one year (refer to *ACS 600/800 Capacitor Reforming Guide* [64059629, English]).
☐	The module is grounded properly.
☐	The input voltage matches the nominal input voltage of the module.
☐	The power connections at UDC+ and UDC– and their tightening torques are OK.
☐	Appropriate DC fuses are installed.
☐	The motor connections at U2, V2 and W2 and their tightening torques are OK.
☐	The motor cable is routed away from other cables.
☐	There are no power factor compensation capacitors in the motor cable.
☐	The external control connections to the inverter unit are OK.
☐	There are no tools, foreign objects or dust from drilling inside the module or cubicle.
☐	All shrouds and covers are in place.
☐	R8i modules with Prevention of unexpected start option only: The voltage selection jumper on the AGPS board is correctly set (230 or 115 V).
☐	The Prevention of unexpected start circuit is completed (See *Electrical installation*).

Motor control and I/O board (RMIO)

What this chapter contains

This chapter shows

- external control connections to the RMIO board for the the ACS 800 Standard Application Program (Factory Macro)
- specifications of the inputs and outputs of the board.

To which products this chapter applies

This chapter applies to ACS800 units which employ the RMIO board.

Note for the ACS800-02 with the enclosure extension and the ACS800-07

The terminals of the RMIO board are wired to optional terminal block X2 (if present). The connections shown below apply also to terminal block X2 (the markings are equal to the ones on the RMIO board).

Terminals of X2 accept cables from 0.5 to 4.0 mm^2 (22 to 12 AWG). Tightening torque: 0.4 to 0.8 Nm (0.3 to 0.6 lbf ft).

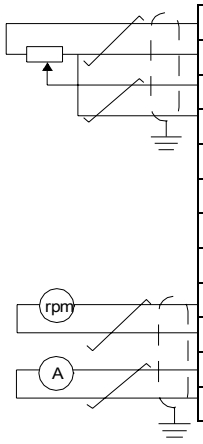
Note for external power supply

WARNING! If the RMIO board is supplied from an external power source, the loose end of the cable removed from the RMIO board terminal must be secured mechanically to a location where it cannot come into contact with electrical parts. If the screw terminal plug of the cable is removed, the wire ends must be individually insulated.

External control connections (non-US)

External control cable connections to the RMIO board for the ACS 800 Standard Application Program (Factory Macro) are shown below. For external control connections of other application macros and programs, see the appropriate *Firmware Manual*.

Terminal block size:
cables 0.3 to 3.3 mm^2 (22 to 12 AWG)
Tightening torque:
0.2 to 0.4 Nm (0.2 to 0.3 lbf ft)



X20

1	VREF-	Reference voltage -10 VDC, 1 kohm ≤ R_L ≤ 10 kohm
2	AGND	

X21

1	VREF+	Reference voltage 10 VDC, 1 kohm ≤ R_L ≤ 10 kohm
2	AGND	
3	AI1+	Speed reference 0(2) ... 10 V, R_{in} > 200 kohm
4	AI1-	
5	AI2+	By default, not in use. 0(4) ... 20 mA, R_{in} = 100 ohm
6	AI2-	
7	AI3+	By default, not in use. 0(4) ... 20 mA, R_{in} = 100 ohm
8	AI3-	
9	AO1+	Motor speed 0(4)...20 mA ≙ 0...motor nom. speed, R_L ≤ 700 ohm
10	AO1-	
11	AO2+	Output current 0(4)...20 mA ≙ 0...motor nom. current, R_L ≤ 700 ohm
12	AO2-	

X22

1	DI1	Stop/Start
2	DI2	Forward/Reverse [1]
3	DI3	Not in use
4	DI4	Acceleration & deceleration select [2]
5	DI5	Constant speed select [3]
6	DI6	Constant speed select [3]
7	+24VD	+24 VDC max. 100 mA
8	+24VD	
9	DGND1	Digital ground
10	DGND2	Digital ground
11	DIIL	Start interlock (0 = stop) [4]

X23

1	+24V	Auxiliary voltage output, non-isolated, 24 VDC 250 mA
2	GND	

X25

1	RO1	Relay output 1: ready
2	RO1	
3	RO1	

X26

1	RO2	Relay output 2: running
2	RO2	
3	RO2	

X27

1	RO3	Relay output 3: fault (-1)
2	RO3	
3	RO3	

Fault

[1] Only effective if par. 10.03 is set to REQUEST by the user.

[2] 0 = open, 1 = closed

DI4	Ramp times according to
0	parameters 22.02 and 22.03
1	parameters 22.04 and 22.05

[3] See par. group 12 CONSTANT SPEEDS.

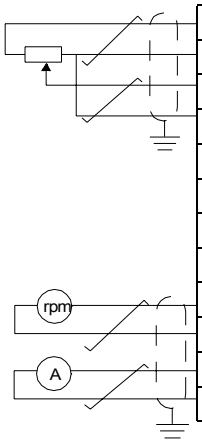
DI5	DI6	Operation
0	0	Set speed through AI1
1	0	Constant speed 1
0	1	Constant speed 2
1	1	Constant speed 3

[4] See parameter 21.09 START INTRL FUNC.

External control connections (US)

External control cable connections to the RMIO board for the ACS 800 Standard Application Program (Factory Macro US version) are shown below. For external control connections of other application macros and programs, see the appropriate *Firmware Manual*.

Terminal block size:
cables 0.3 to 3.3 mm^2 (22 to 12 AWG)
Tightening torque:
0.2 to 0.4 Nm (0.2 to 0.3 lbf ft)



X20

1	VREF-	Reference voltage -10 VDC, 1 kohm ≤ R_L ≤ 10 kohm
2	AGND	

X21

1	VREF+	Reference voltage 10 VDC, 1 kohm ≤ R_L ≤ 10 kohm
2	AGND	
3	AI1+	Speed reference 0(2) ... 10 V, R_{in} > 200 kohm
4	AI1-	
5	AI2+	By default, not in use. 0(4) ... 20 mA, R_{in} = 100 ohm
6	AI2-	
7	AI3+	By default, not in use. 0(4) ... 20 mA, R_{in} = 100 ohm
8	AI3-	
9	AO1+	Motor speed 0(4)...20 mA ≙ 0...motor nom. speed, R_L ≤ 700 ohm
10	AO1-	
11	AO2+	Output current 0(4)...20 mA ≙ 0...motor nom. current, R_L ≤ 700 ohm
12	AO2-	

X22

1	DI1	Start (⌐‾)
2	DI2	Stop (‾⌐)
3	DI3	Forward/Reverse [1]
4	DI4	Acceleration & deceleration select [2]
5	DI5	Constant speed select [3]
6	DI6	Constant speed select [3]
7	+24VD	+24 VDC max. 100 mA
8	+24VD	
9	DGND1	Digital ground
10	DGND2	Digital ground
11	DIIL	Start interlock (0 = stop) [4]

X23

1	+24V	Auxiliary voltage output, non-isolated, 24 VDC 250 mA
2	GND	

X25

1	RO1	Relay output 1: ready
2	RO1	
3	RO1	

X26

1	RO2	Relay output 2: running
2	RO2	
3	RO2	

X27

1	RO3	Relay output 3: fault (-1)
2	RO3	
3	RO3	

Fault

[1] Only effective if par. 10.03 is set to REQUEST by the user.

[2] 0 = open, 1 = closed

DI4	Ramp times according to
0	parameters 22.02 and 22.03
1	parameters 22.04 and 22.05

[3] See par. group 12 CONSTANT SPEEDS.

DI5	DI6	Operation
0	0	Set speed through AI1
1	0	Constant speed 1
0	1	Constant speed 2
1	1	Constant speed 3

[4] See parameter 21.09 START INTRL FUNC.

RMIO board specifications

Analogue inputs

	With Standard Application Program two programmable differential current inputs (0 mA / 4 mA ... 20 mA, R_{in} = 100 ohm) and one programmable differential voltage input (-10 V / 0 V / 2 V ... +10 V, R_{in} > 200 kohm).
	The analogue inputs are galvanically isolated as a group.
Isolation test voltage	500 VAC, 1 min
Max. common mode voltage between the channels	±15 VDC
Common mode rejection ratio	$\geq$ 60 dB at 50 Hz
Resolution	0.025 % (12 bit) for the -10 V ... +10 V input. 0.5 % (11 bit) for the 0 ... +10 V and 0 ... 20 mA inputs.
Inaccuracy	± 0.5 % (Full Scale Range) at 25 °C (77 °F). Temperature coefficient: ± 100 ppm/°C (± 56 ppm/°F), max.

Constant voltage output

Voltage	+10 VDC, 0, -10 VDC ± 0.5 % (Full Scale Range) at 25 °C (77 °F). Temperature coefficient: ± 100 ppm/°C (± 56 ppm/°F) max.
Maximum load	10 mA
Applicable potentiometer	1 kohm to 10 kohm

Auxiliary power output

Voltage	24 VDC ± 10 %, short circuit proof
Current consumption	250 mA (without any optional modules inserted onto slots 1 and 2); 1.2 A max

Analogue outputs

	Two programmable current outputs: 0 (4) to 20 mA, $R_L \leq$ 700 ohm
Resolution	0.1 % (10 bit)
Inaccuracy	± 1 % (Full Scale Range) at 25 °C (77 °F). Temperature coefficient: ± 200 ppm/°C (± 111 ppm/°F) max.

Digital inputs

	With Standard Application Program six programmable digital inputs (common ground: 24 VDC, -15 % to +20 %) and a start interlock input. Group isolated, can be divided in two isolated groups (see *Isolation and grounding diagram* below).
	Thermistor input: 5 mA, < 1.5 kohm ≙ “1” (normal temperature), > 4 kohm ≙ “0” (high temperature), open circuit ≙ “0” (high temperature).
	Internal supply for digital inputs (+24 VDC): short circuit proof. An external 24 VDC supply can be used instead of the internal supply.
Isolation test voltage	500 VAC, 1 min
Logical thresholds	< 8 VDC ≙ “0”, > 12 VDC ≙ “1”
Input current	DI1 to DI 5: 10 mA, DI6: 5 mA
Filtering time constant	1 ms

Relay outputs

	Three programmable relay outputs
Switching capacity	8 A at 24 VDC or 250 VAC, 0.4 A at 120 VDC
Minimum continuous current	5 mA rms at 24 VDC
Maximum continuous current	2 A rms
Isolation test voltage	4 kVAC, 1 minute

DDCS fibre optic link

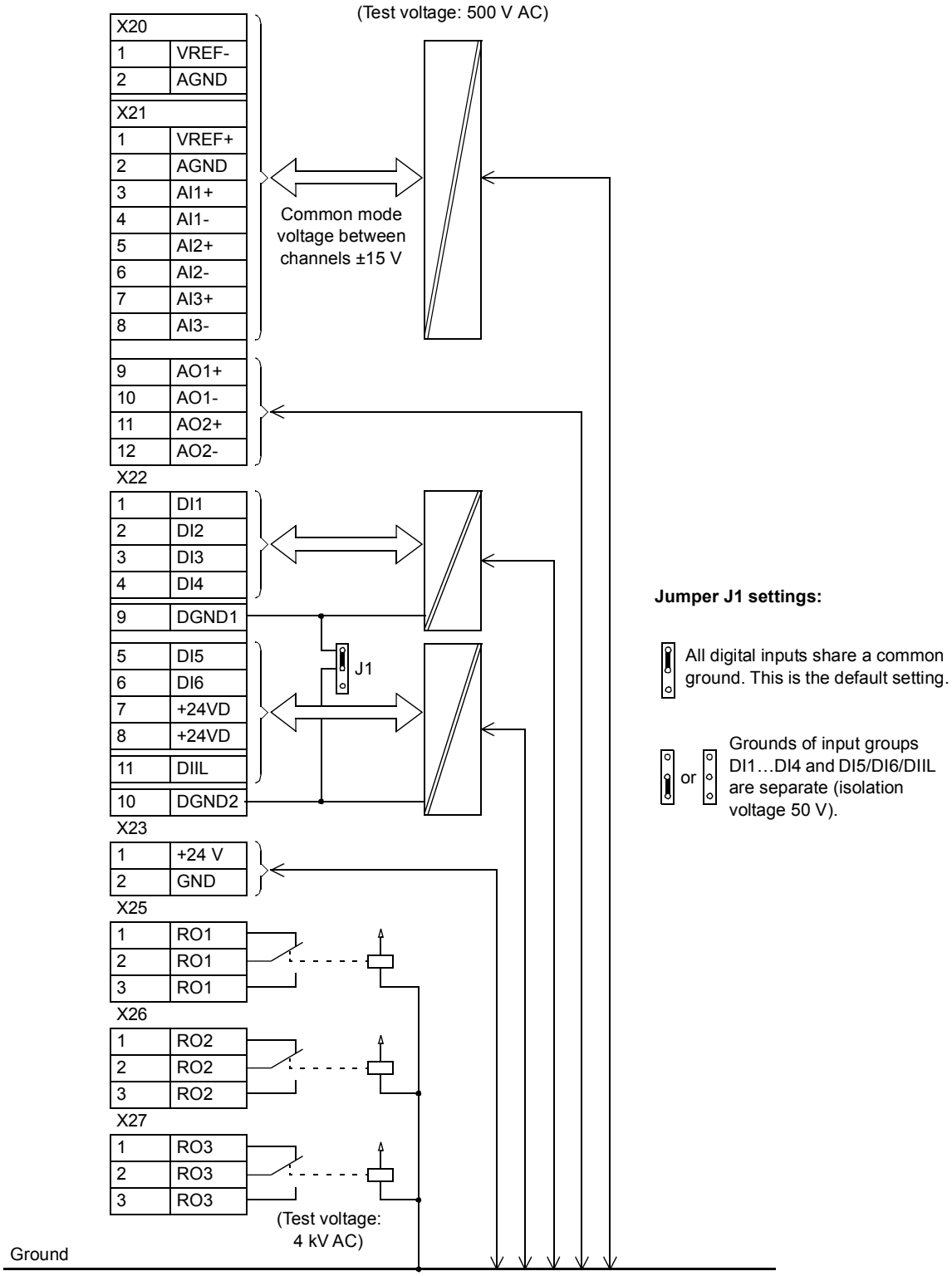
	With optional communication adapter module RDCO. Protocol: DDCS (ABB Distributed Drives Communication System)

24 VDC power input

Voltage	24 VDC ± 10%
Typical current consumption (without optional modules)	250 mA
Maximum current consumption	1200 mA (with optional modules inserted)

The terminals on the RMIO board as well as on the optional modules attachable to the board fulfil the Protective Extra Low Voltage (PELV) requirements stated in EN 50178 provided that the external circuits connected to the terminals also fulfil the requirements.

Isolation and grounding diagram



Maintenance

What this chapter contains

This chapter contains preventive maintenance instructions, and a description of the LEDs of the drive.

Safety instructions

Only a qualified electrician is allowed to perform the maintenance.

Before starting work on the drive system,

- isolate the drive system from the main supply
- open the switch-disconnectors and lock them out in the open position
- switch off any voltages connected to the I/O terminals
- wait for 5 minutes to let the intermediate circuit capacitors discharge
- ensure there is no dangerous voltage present by measuring the voltage on the input, I/O and intermediate circuit terminals.

Maintenance intervals

This table lists the routine maintenance intervals recommended by ABB.

Maintenance	Interval	Instructions
Capacitor reforming	Every year when stored	See *Capacitor reforming*.
Heatsink temperature check and cleaning	Depending on the dustiness of the environment, every 6 to 12 months	See *Heatsinks*.
Cabinet air filter check; replacement if necessary	Every year	See *Checking and replacing the air filters*.
Frame R4i and R5i inverter modules: Change of additional cooling fan	Every 3 years	See *Cooling fans*.
Frame R8i inverter modules: Check and cleaning of power connections	Every 4 years	See *Power connections (R8i)*.
Cooling fan change	Every 5 years	See *Cooling fans*.
Frame R4i and larger inverter modules: capacitor renewal	Every 10 years	See *Capacitors*.

Checking and replacing the air filters

Before replacing the air filters of the cabinet, read and repeat the steps in the safety instructions above.

Heatsinks

Heatsink fins pick up dust from the cooling air. Inverter modules run into overtemperature warnings and faults if the heatsink is not clean. In a “normal” environment (not dusty, not clean) the heatsink should be checked annually, in a dusty environment more often.

Clean the heatsink as follows (when necessary):

1. Remove the cooling fan as described in *Cooling fans* elsewhere in this chapter.
2. Blow clean, dry compressed air from bottom to top and simultaneously use a vacuum cleaner at the air outlet to trap the dust. **Note:** Prevent the dust from entering adjoining equipment.
3. Refit the cooling fan.

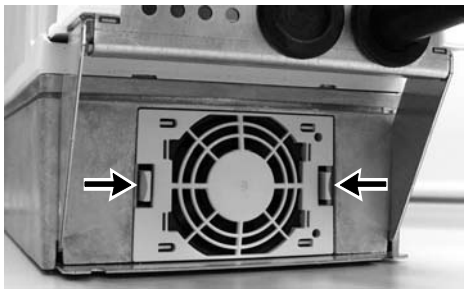
Cooling fans

The cooling fan lifespan is about 60 000 operating hours. The actual lifespan depends on the drive usage and ambient temperature. See the appropriate ACS 800 firmware manual for an actual signal which indicates the hours of usage of the fan.

Fan failure can be predicted by the increasing noise from fan bearings and the gradual rise in the heatsink temperature in spite of heatsink cleaning. If the drive is operated in a critical part of a process, fan replacement is recommended once these symptoms start appearing. Replacement fans are available from ABB. Do not use other than ABB-specified spare parts.

Fan replacement (R2i, R3i)

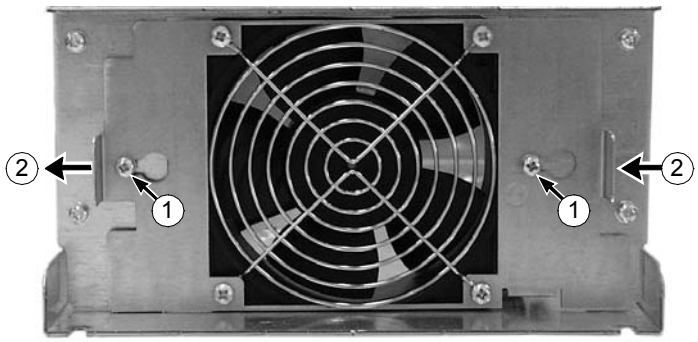
To remove the fan, release the retaining clips. Disconnect the cable. Install the fan in reverse order.

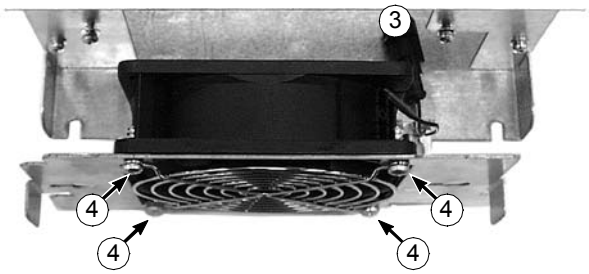


Bottom view

Fan replacement (R4i)

1. Loosen the screws that fasten the fan mounting plate to the frame.
2. Shift the fan mounting plate to the left and pull the fan assembly out.
3. Disconnect the fan power cable.
4. Undo the screws that fasten the fan to the fan mounting plate.
5. Install the new fan in reverse order.

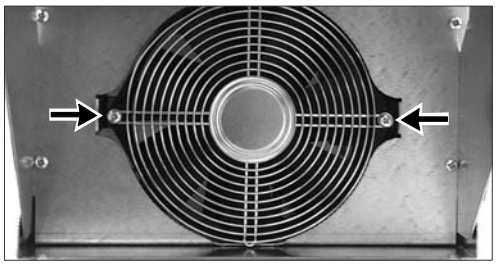




Fan replacement (R5i)

To remove the fan, undo the fixing screws. Disconnect the cable. Install the fan in reverse order.

Bottom view

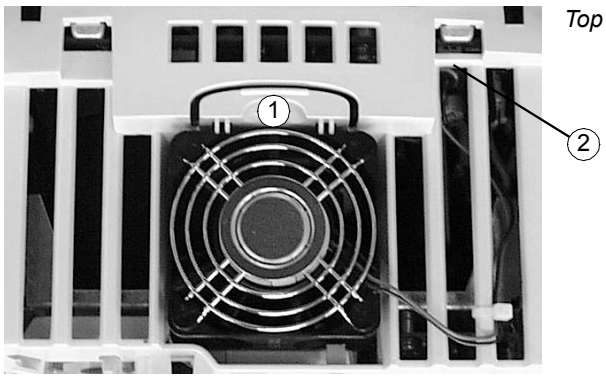


Additional fan

Types -0004-2, 0005-2, -0011-2 to -0020-2, -0006-3, -0009-3, -0020-3 to -0030-3, -0009-5, 0011-5, -0025-5 to -0040-5 have an additional fan.

Replacement (R2i, R3i)

Remove the front cover. To remove the fan, release the retaining clip (1). Disconnect the cable (2, detachable terminal). Install the fan in reverse order.



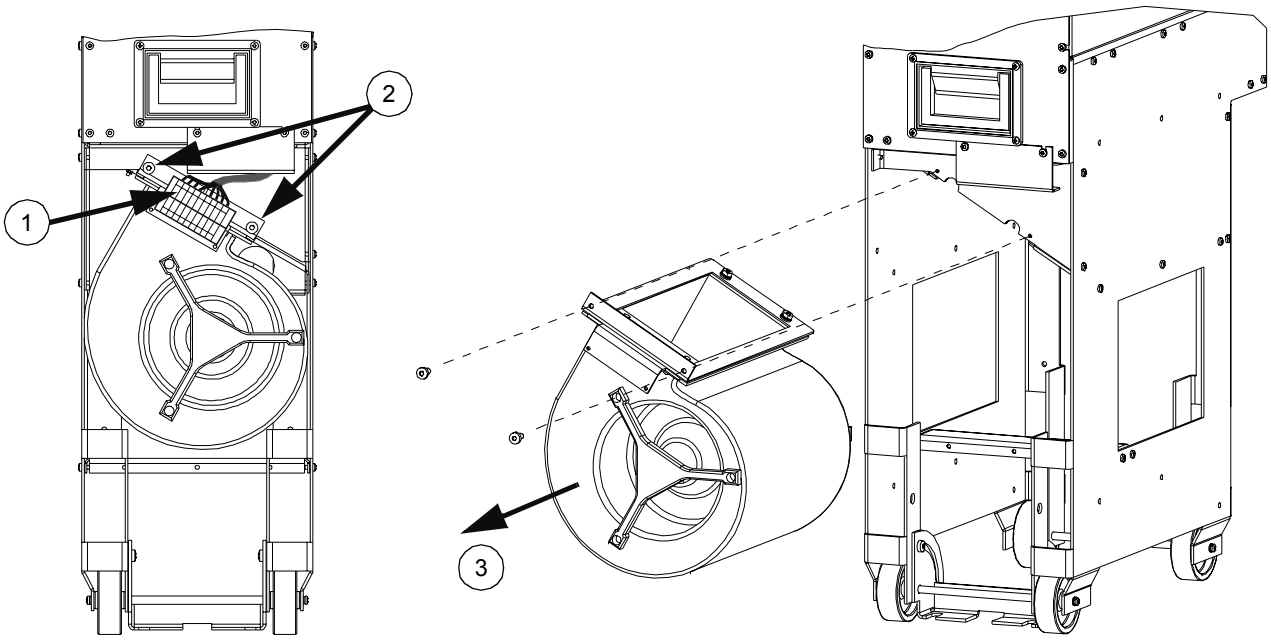
Top view

Replacement (R4i, R5i)

Remove the front cover. The fan is located on the lower right-hand side of the unit (R4) or on the right-hand side of the control panel (R5). Lift the fan out and disconnect the cable. Install the fan in reverse order.

Fan replacement (R8i)

1. Read and repeat the steps in the safety instructions above.
2. Open the inverter cubicle doors.
3. Disconnect the fan wiring plug (1).
4. Remove the locking screws (2).
5. Pull the fan out along its sliding rails (3).
6. Install a new fan in reverse order.



Power connections (R8i)

1. Read and repeat the steps in the safety instructions above.
2. Open the cabinet doors.
3. Extract one inverter module from the cabinet as described in the motor cable connection procedures in the chapter *Electrical installation*.
4. Check the tightness of the cable connections at the quick connector. Use the tightening torque table in *Technical data*.
5. Clean all contact surfaces of the quick connector and apply a layer of suitable joint compound (e.g. Isoflex® Topas NB 52 from Klüber Lubrication) onto them.
6. Re-insert the inverter module.
7. Repeat steps 3 to 6 for all remaining R8i inverter modules.

Capacitors

The drive intermediate circuit employs several electrolytic capacitors. Their lifespan is from 45 000 to 90 000 hours depending on drive loading and ambient temperature. Capacitor life can be prolonged by lowering the ambient temperature.

It is not possible to predict a capacitor failure. Capacitor failure is usually followed by a mains fuse failure or a fault trip. Contact ABB if capacitor failure is suspected. Replacements are available from ABB. Do not use other than ABB-specified spare parts.

Capacitor reforming

Reform (re-age) spare part capacitors once a year according to *ACS 600/800 Capacitor Reforming Guide* (code: 64059629).

LEDs

This table describes LEDs of the drive.

Where	LED	When the LED is lit
RMIO board *	Red	Drive in fault state
	Green	The power supply on the board is OK.
Control panel mounting platform	Red	Drive in fault state
	Green	The main +24 V power supply for the control panel and the RMIO board is OK.

* the LEDs are not visible in frame sizes R2i to R5i

ACS800-104 ordering information

What this chapter contains

This chapter lists the components and accessories specific to the ACS800-104 inverter module range.

See the *ACS800 Product Reference* (3AFE 64813340 [English]) for generic equipment for the ACS 800 product family such as control panels, I/O options, application programs and PC tools.

Inverter modules

The following tables list the ACS800-104 inverter modules available.

Notes:

- The application program for the modules must be specified when ordering
- Control panel (CDP 312R) is not included
- Frame R6i and R7i modules require an external fan
- The modules have coated circuit boards as standard equipment.

Frame sizes R2i to R7i

Option key: **+Q950**: Prevention of unexpected start (for more information, see the document *ACS 800 MultiDrive; Planning the Electrical Installation* [3AFE 64783742, English]).

Inverter modules (R2i to R7i)				
ACS800-104 type	**Frame size**	**$P_{cont.max}$ (kW)**	**Order code**	
			(no options)	**+Q950**
U_N = 400 V (380/400/415 V)				
ACS800-104-0003-3	R2i	1.5	64685724	64741730
ACS800-104-0004-3	R2i	2.2	64704338	64751972
ACS800-104-0005-3	R2i	3	64704346	64751999
ACS800-104-0006-3	R2i	4	64704354	64752162
ACS800-104-0009-3	R2i	5.5	64704362	64752243
ACS800-104-0011-3	R3i	7.5	64702262	64752464
ACS800-104-0016-3	R3i	11	64704478	64752529
ACS800-104-0020-3	R3i	15	64704486	64752723
ACS800-104-0025-3	R4i	22	64702271	64752812
ACS800-104-0030-3	R4i	30	64704524	64752855
ACS800-104-0040-3	R5i	37	64702246	64759833
ACS800-104-0050-3	R5i	45	64702254	64759922
ACS800-104-0060-3	R5i	55	64704320	64759965
ACS800-104-0100-3	R7i	75	68253390	68260400
ACS800-104-0120-3	R7i	90	68253411	68260418
U_N = 500 V (380/400/415/440/460/480/500 V)				
ACS800-104-0004-5	R2i	2.2	64704419	64752065

Inverter modules (R2i to R7i)				
ACS800-104 type	**Frame size**	$P_{cont.max}$ **(kW)**	**Order code**	
			(no options)	**+Q950**
ACS800-104-0005-5	R2i	3	64704427	64752111
ACS800-104-0006-5	R2i	4	64704435	64752146
ACS800-104-0009-5	R2i	5.5	64704443	64752201
ACS800-104-0011-5	R2i	7.5	64704451	64752278
ACS800-104-0016-5	R3i	11	64704494	64752626
ACS800-104-0020-5	R3i	15	64704508	64752707
ACS800-104-0025-5	R3i	18.5	64704516	64752758
ACS800-104-0030-5	R4i	22	64704532	64752839
ACS800-104-0040-5	R4i	30	64704541	64752863
ACS800-104-0050-5	R5i	37	64704567	64759990
ACS800-104-0060-5	R5i	45	64704583	64760033
ACS800-104-0070-5	R5i	55	64704591	64760041
ACS800-104-0100-5	R6i	75	68260434	68260469
ACS800-104-0120-5	R7i	90	68260442	68260477
ACS800-104-0140-5	R7i	110	68260451	68260493
U_N = 690 V (525/575/600/660/690 V)				
ACS800-104-0011-7	R4i	11	64771116	64772473
ACS800-104-0016-7	R4i	15	64772074	64772481
ACS800-104-0020-7	R4i	18.5	64772082	64772490
ACS800-104-0025-7	R4i	22	64772091	64772503
ACS800-104-0030-7	R4i	30	64772104	64772511
ACS800-104-0040-7	R4i	30	64772171	64772520
ACS800-104-0050-7	R5i	45	64772325	64772538
ACS800-104-0060-7	R5i	55	64772376	64772546
ACS800-104-0070-7	R6i	55	68260515	68260540
ACS800-104-0100-7	R7i	75	68260523	68260558
ACS800-104-0120-7	R7i	90	68260531	68260566

PDM-256538

Frame size R8i and multiples

Multiple R8i inverter modules can be connected in parallel to produce higher output powers. The table below shows the quantity and order code of inverter modules required for each inverter unit.

Option key:
+C126: Speed-controlled cooling fan supplied from the DC bus
+E205: du/dt filtering (required for 690 V modules, and parallel-connected modules)
+Q950: Prevention of unexpected start (factory-installed in parallel-connected modules) (for more information, see the document *ACS800 MultiDrive; Planning the Electrical Installation* [3AFE 64783742, English]).

Inverter modules (R8i and multiples)											
Inverter unit type	**Order code**									**Consists of modules of type…**	
ACS800-104…	**Qty**	**no options**	**+C126**	**+E205**	**+Q950**	**+C126 +E205**	**+C126 +Q950**	**+E205 +Q950**	**+C126 +E205 +Q950**	**Qty**	**ACS800-104-…**
U_N = 400 V											
0170-3	1	68262194	68260906	68262330	68262283	68260949	68260922	68262445	68260965	1	0170-3
0210-3	1	68262208	68260914	68262356	68262291	68260957	68260931	68262526	68260973	1	0210-3
0260-3	1	68262224	68259231	68262364	68262305	68259746	68259762	68262551	68259754	1	0260-3
0320-3	1	68262232	64766058	68262411	68262313	64766121	64766139	68262577	64766031	1	0320-3
0390-3	1	64694383	64793969	64694367	64694375	64793985	64794001	64694332	64793993	1	0390-3
0510-3	1	64694324	64794019	64694294	64694308	64792580	64794051	64694286	64792598	1	0510-3
0770-3	1	–	–	–	–	–	–	68259410	68259436	2	0390-3
1030-3	1	–	–	–	–	–	–	68259461	68259487	2	0510-3
1540-3	1	–	–	–	–	–	–	68259941	68259975	3	0510-3
2050-3	1	–	–	–	–	–	–	68260027	68260051	4	0510-3
U_N = 500 V											
0210-5	1	68263531	68260981	68263689	68263611	68261023	68261007	68263751	68261040	1	0210-5
0260-5	1	68263565	68260990	68263697	68263620	68261031	68261015	68263760	68261066	1	0260-5
0320-5	1	68263581	68259258	68263719	68263638	68259703	68259738	68263816	68259720	1	0320-5
0400-5	1	68263590	64766252	68263727	68263646	64766244	64766236	68263824	64766201	1	0400-5
0460-5	1	64694197	64794124	64650289	64694189	64794159	64794183	64650297	64794167	1	0460-5
0610-5	1	64694162	64794191	64650301	64694154	64794205	64794221	64650319	64794213	1	0610-5
0910-5	1	–	–	–	–	–	–	68260116	68260132	2	0460-5
1210-5	1	–	–	–	–	–	–	68260574	68260591	2	0610-5
1820-5	1	–	–	–	–	–	–	68260612	68260647	3	0610-5
2430-5	1	–	–	–	–	–	–	68260655	68260671	4	0610-5
U_N = 690 V											
0210-7	1	–	–	68263841	–	68261074	–	68263921	68261091	1	0210-7
0260-7	1	–	–	68263859	–	68259665	–	68263930	68259681	1	0260-7
0320-7	1	–	–	68263875	–	68261082	–	68263956	68261104	1	0320-7
0400-7	1	–	–	68263883	–	64766406	–	68263972	64766309	1	0400-7
0440-7	1	–	–	64650327	–	64793918	–	64650335	64793926	1	0440-7
0580-7	1	–	–	64650343	–	64792571	–	64650351	64794086	1	0580-7
0870-7	1	–	–	–	–	–	–	68260728	68261155	2	0440-7
1160-7	1	–	–	–	–	–	–	68261163	68261198	2	0580-7
1740-7	1	–	–	–	–	–	–	68261201	68261210	3	0580-7
2320-7	1	–	–	–	–	–	–	68261228	68261236	4	0580-7

DC fuses and fuse bases; DC switch fuses

The inverter unit can be connected to the DC bus through either fuses only or a switch fuse. See the chapter *Circuit diagrams*.

Fitting a switch fuse enables the isolation and reconnection of an inverter module even when the DC bus is energised. On the other hand, an external circuit is required for controlled charging of the capacitor bank of the module when the switch fuse is closed. For frame R2i to R5i inverter modules, only the DC fuses are required in addition to the switch fuse kit since the modules contain an internal charging circuit. R6i, R7i and R8i (and multiples) inverter units require the switch fuse kit, DC fuses, and fuses for the charging circuit.

The tables below specify the DC fuses, DC fuse bases, switch fuse kits, and charging circuit fuses for the ACS800-104 inverter units.

DC fuses and fuse bases/Switch fuse kits for inverter modules										
Module type ACS800-104-…	**DC fuse**				**DC fuse base**				**Switch fuse kit (see below)**	
	Qty	**Type**	**Info**	**Order code**	**Qty**	**Type**	**Info**	**Order code**	**Qty**	**Order code**
0003-3 0004-5 0004-3 0005-5 0005-3 0006-5 0006-3 0009-5 0009-3 0011-5	2	170M 1561	25A 660V	10028566	1	OFAX 00S2L	2×125A 690V	58065749	1	64089650
0011-3 0016-5 0016-3 0020-5	2	170M 1564	50A 660V	09838767	1	OFAX 00S2L	2×125A 690V	58065749	1	64089650
0020-3 0025-5 0025-3 0030-5	2	170M 1566	80A 660V	09838791	1	OFAX 00S2L	2×125A 690V	58065749	1	64089650
0030-3 0040-5 0040-3 0050-5 0050-3 0060-5	2	170M 1569	160A 660V	10003521	1	OFAX 00S2L	2×125A 690V	58065749	1	64089650
0060-3 0070-5	2	170M 1570	200A 660V	10003539	1	OFAX 00S2L	2×125A 690V	58065749	1	64089650
0100-5	2	170M 1570	200A 660V	10003539	1	OFAX 00S2L	2×125A 690V	58065749	1	64089561
0100-3 0120-5 0120-3 0140-5	2	170M 3818	350A 660V	10028582	1	OFAX 1S2	2×250A 690V	10029082	1	64349619 (230V) 64349627 (115V)
0170-3 0210-5 0210-3 0260-5 0260-3 0320-5 0320-3 0400-5	2	170M 8545	800A 690V	64786423	2	OFASA 3	630A 690V	35009841	1	64808796
0390-3 0460-5	2	170M 8547	1250A 690V	64786512	2	OFASA 3	630A 690V	35009841	1	64808796
0510-3 0610-5	2	170M 8550	1600A 690V	64673734	2	OFASA 3	630A 690V	35009841	1	64808796
0770-3 0910-5	4	170M 8547	1250A 690V	64786512	4	OFASA 3	630A 690V	35009841	1	64808800
1030-3 1210-5	4	170M 8550	1600A 690V	64673734	4	OFASA 3	630A 690V	35009841	1	64808800
1540-3 1820-5	6	170M 8550	1600A 690V	64673734	6	OFASA 3	630A 690V	35009841	1	64808826
2050-3 2430-5	8	170M 8550	1600A 690V	64673734	8	OFASA 3	630A 690V	35009841	2	64808800
0011-7	2	170M 2674	25A 1000V	10032041	1	OFAX 00S2L	2×125A 690V	58065749	1	64089650
0016-7 0020-7	2	170M 2676	35A 1000V	10033250	1	OFAX 00S2L	2×125A 690V	58065749	1	64089650
0025-7 0030-7	2	170M 2679	63A 1000V	10029791	1	OFAX 00S2L	2×125A 690V	58065749	1	64089650
0040-7 0050-7	2	170M 2680	80A 1000V	10029805	1	OFAX 00S2L	2×125A 690V	58065749	1	64089650

DC fuses and fuse bases/Switch fuse kits for inverter modules										
Module type ACS800-104-…	**DC fuse**				**DC fuse base**				**Switch fuse kit (see below)**	
	Qty	**Type**	**Info**	**Order code**	**Qty**	**Type**	**Info**	**Order code**	**Qty**	**Order code**
0060-7	2	170M 2682	125A 1000V	10029813	1	OFAX 00S2L	2×125A 690V	58065749	1	64089650
0070-7	2	170M 2682	125A 1000V	10029813	1	OFAX 00S2L	2×125A 690V	58065749	1	64089684
0100-7 0120-7	2	170M 4700	200A 1000V	10001731	1	OFAX 1S2	2×250A 690V	10029082	1	64349643 (230V) 64349651 (115V)
0210-7 0260-7 0320-7 0400-7	2	170M 6205	630A 1000V	10001773	2	OFASA 3	630A 690V	35009841	1	64808796
0440-7	2	170M 6203	800A 1250V	10029881	2	OFASA 3	630A 690V	35009841	1	64808842
0580-7	2	170M 8650	1000A 1000V	64673769	2	OFASA 3	630A 690V	35009841	1	64808842
0870-7	4	170M 6203	800A 1250V	10029881	4	OFASA 3	630A 690V	35009841	1	64808851
1160-7	4	170M 8650	1000A 1000V	64673769	4	OFASA 3	630A 690V	35009841	1	64808851
1740-7	6	170M 8650	1000A 1000V	64673769	6	OFASA 3	630A 690V	35009841	1	64808877
2320-7	8	170M 8650	1000A 1000V	64673769	8	OFASA 3	630A 690V	35009841	2	64808851

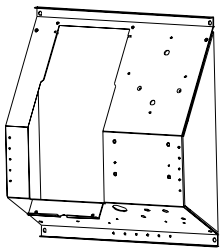
Switch fuse kit contents	
Order code	**Kit contents**
64089561	1–Switch Fuse (OESA00-160D2PL) • 1–Mounting Frame for 4 aux. contacts • 4–Aux. Contact (2–NO, 1–NO gold-plated, 1–NC) • 1–Resistor (ZRF 30×167,5) • 1–Contactor (LP1-D501124) • 1–Relay, 11-pole • 1–Relay Socket
64089650	1–Switch Fuse (OESA00-160D2PL) • 1–Mounting Frame for 4 aux. contacts • 4–Aux. Contact (2–NO, 1–NO gold-plated, 1–NC)
64089684	1–Switch Fuse (OESA00D2PL) • 1–Mounting Frame for 4 aux. contacts • 4–Aux. Contact (2–NO, 1–NO gold-plated, 1–NC) • 2–Resistor (ZRF 30×165) • 1–Contactor (BC 25-30-10/24) • 1–Relay, 11-pole • 1–Relay Socket
64349619	1–Switch Fuse (OESA250DR2PL-21/1, including: locking device, charging contacts, 1–NC contact, 1–NO contact) • 1–Aux. Contact (OZXK 2, including: 2–NC contact, 2–NO contact) • 2–Resistor (ZRF 30×167,5) • 1–Charging Monitoring Unit (NCHM-21C) • 1–Wire Set, OESA control wiring
64349627	1–Switch Fuse (OESA250DR2PL-X, including: locking device, charging contacts, 1–NC contact, 1–NO contact) • 1–Aux. Contact (OZXK 2, including: 2-NC contact, 2–NO contact) • 2–Resistor (ZRF 30×167,5) • 1–Charging Monitoring Unit (NCHM-11C) • 1–Wire Set, OESA control wiring
64349643	1–Switch Fuse (OESA250DR2PL-21/1, including: locking device, charging contacts, 1–NC contact, 1–NO contact) • 1–Aux. Contact (OZXK 2, including: 2-NC contact, 2–NO contact) • 2–Resistor (ZRF 30×165) • 1–Charging Monitoring Unit (NCHM-21C) • 1–Wire Set, OESA control wiring
64349651	1–Switch Fuse (OESA250DR2PL-X, including: locking device, charging contacts, 1–NC contact, 1–NO contact) • 1–Aux. Contact (OZXK 2, including: 2-NC contact, 2–NO contact) • 2–Resistor (ZRF 30×165) • 1–Charging Monitoring Unit (NCHM-11C) • 1–Wire Set, OESA control wiring
64808796	1–Switch Fuse (OESL630/32D02) • 2–Resistor (ZRF 30×167,5) • 1–Switch fuse controller (ASFC-01C)
64808800	1–Switch Fuse (OESL630/32D04) • 4–Resistor (ZRF 30×167,5) • 1–Switch fuse controller (ASFC-01C)
64808826	1–Switch Fuse (OESL630/32D06) • 6–Resistor (ZRF 30×167,5) • 1–Switch fuse controller (ASFC-01C)
64808842	1–Switch Fuse (OESL630/32D02) • 2–Resistor (ZRF 30×165) • 1–Switch fuse controller (ASFC-01C)
64808851	1–Switch Fuse (OESL630/32D04) • 4–Resistor (ZRF 30×165) • 1–Switch fuse controller (ASFC-01C)
64808877	1–Switch Fuse (OESL630/32D06) • 6–Resistor (ZRF 30×165) • 1–Switch fuse controller (ASFC-01C)

Charging circuit fuses for inverter modules									
Module type ACS800-104-…			**Fuse**				**Fuse base**			
			Qty	**Type**	**Info**	**Order code**	**Qty**	**Type**	**Info**	**Order code**
0100-3 0120-3	0100-5 0120-5 0140-5		2	170M 1564	50A 660V	09838767	1	OFAX 00S2L	2×125A 690V	58065749
0170-3 0210-3 0260-3 0320-3	0210-5 0260-5 0320-5 0400-5	0070-7 0100-7 0120-7 0210-7 0260-7 0320-7 0400-7 0440-7 0580-7 0870-7 1160-7 1740-7	2	170M 2690	10A 1000V	10032601	1	OFAX 00S2L	2×125A 690V	58065749
0390-3 0510-3 0770-3 1030-3 1540-3	0460-5 0610-5 0910-5 1210-5 1820-5		2	170M 1564	50A 660V	09838767	1	OFAX 00S2L	2×125A 690V	58065749
2050-3	2430-5		4	170M 1564	50A 660V	09838767	2	OFAX 00S2L	2×125A 690V	58065749
		2320-7	4	170M 2690	10A 1000V	10032601	2	OFAX 00S2L	2×125A 690V	58065749

Inclined mounting plates for R2i to R5i modules

Ready-made mounting plates for inclined mounting of frame R2i to R5i inverter modules – as exemplified in the chapter *Cabinet construction* – are available. The designs are also shown in *Dimensional drawings*.

Inclined mounting plates for R2i to R5i modules	
Frame size	**Order code**
R2i	64739328
R3i	64739174
R4i	64739344
R5i	64739352



64739328

Cooling fans for R6i and R7i modules

Frame R6i and R7i inverter modules require an external cooling fan that is to be fed from the 230/115 V AC auxiliary voltage source. There are two types available depending on the voltage.

The inverter module and the cooling fan are connected by either the mounting plate listed below (#64138375; a separate air baffle required) or a combined air baffle/ mounting plate. Both mounting plates are shown in *Dimensional drawings*.

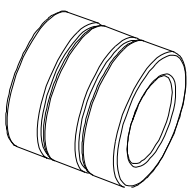
Cooling fans for R6i and R7i modules		
Kit	**Information**	**Order code**
Fan (230 VAC)	Fan type: G2E140-P151-09. Connection cable length: 1.5 m (5 ft).	64114158
Fan (115 VAC)	Fan type: G2E140-AI32-ABB. Connection cable length: 1.5 m (5 ft).	64114191
Mounting plate	Use a separate air baffle.	64138375

Common mode filters for R6i to R8i modules

Common mode filtering reduces bearing currents and is required for electromagnetic compatibility (EMC). The filtering is implemented by using toroids.

With R6i and R7i modules, the toroids are installed on the output (motor) cable according to the instructions given in *Electrical installation*, section *Power connections – Frames R6i and R7i*.

With R8i modules, common mode filtering is implemented by installing three toroidal cores onto the DC input of each module. The DC busbar sets listed later in this chapter contain holders for the common mode filters.

Common mode filters for R6i to R8i modules			
Kit	**Contents**	**Quantity**	**Order code**
Common mode filter kit		1 kit per inverter module	64315811

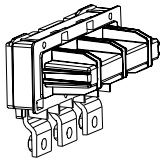
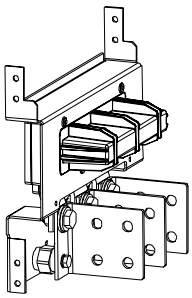
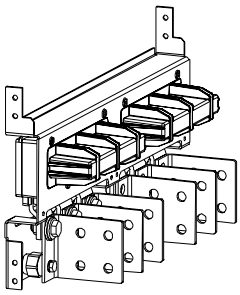
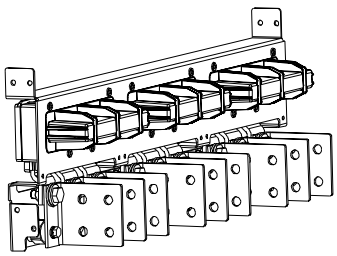
Installation parts for R8i modules

The following tables list the R8i installation parts available from ABB.

Also refer to the drawings in the chapters *Cabinet construction* and *Dimensional drawings*.

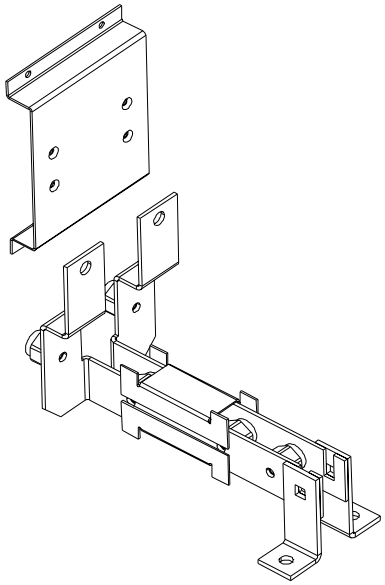
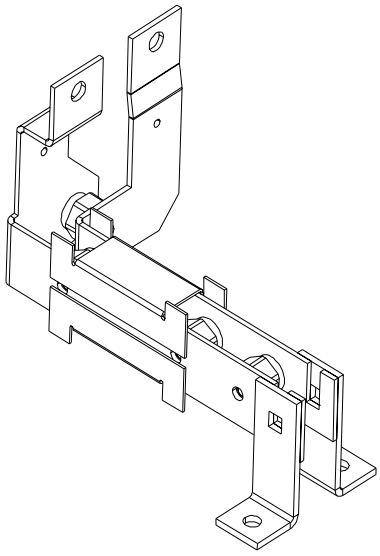
Quick connector chassis socket kits

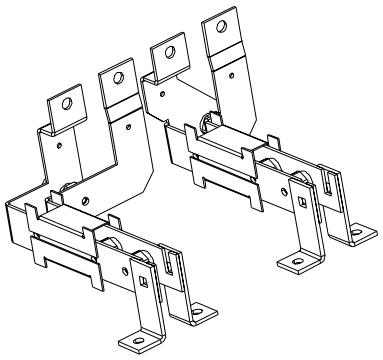
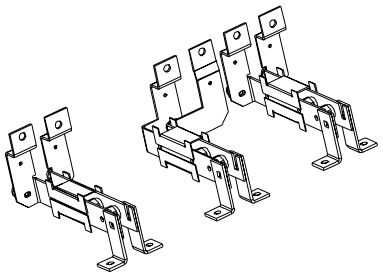
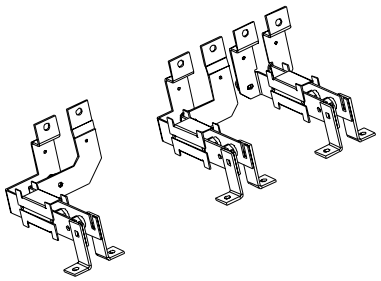
The chassis socket part of the quick connector is to be mounted on the rear pillars of the cubicle. The socket can also be mounted on the back plate.

Quick connector kits for R8i modules			
Kit	**For…**	**Contents of 1 kit**	**Order code**
Connector only	Single R8i module	1 pc Quick connector 	64698401
Connector with mounting parts and output busbars	Single R8i module	1 pc Quick connector 1 pc Mounting plate 3 pcs Output busbar 3 pcs Support insulator 	68239427
	Two R8i modules side by side	2 pcs Quick connector 1 pcs Mounting plate 6 pcs Output busbar 6 pcs Support insulator 	68239435
	Three R8i modules side by side	3 pcs Quick connector 1 pcs Mounting plate 9 pcs Output busbar 9 pcs Support insulator 	68242231
	1 + 2 R8i modules	68239427 + 68239435	68260744

DC busbar kits

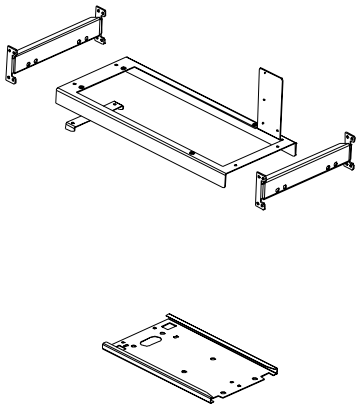
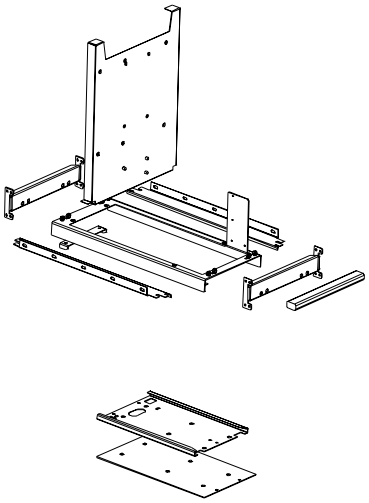
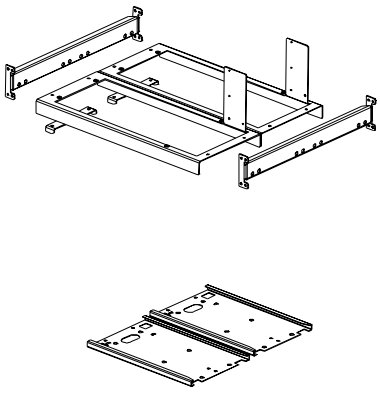
These kits contain the parts needed to connect the DC busbars of the inverter module and the DC switch fuse or DC fuses. The common mode filters (optionally available) are to be installed on the DC busbars.

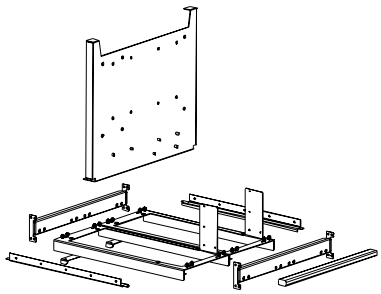
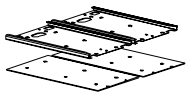
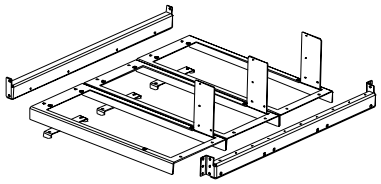
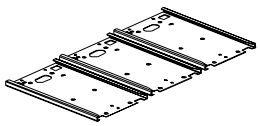
DC busbar kits for R8i modules			
Kit	**For…**	**Contents of 1 kit**	**Order code**
Connecting busbars from fuse bases to DC input of module	Single R8i module	4 pcs Busbar 2 pcs Holder for common mode filters 5 pcs Support insulator 1 pc Mounting plate for fuse bases 	64806823
Connecting busbars from switch fuse (OESL) to DC input of module	Single R8i module (2-pole switch fuse)	4 pcs Busbar 2 pcs Holder for common mode filters 5 pcs Support insulator 	68256747

DC busbar kits for R8i modules			
Kit	**For…**	**Contents of 1 kit**	**Order code**
Connecting busbars from switch fuse (OESL) to DC input of module	Two R8i modules side by side (4-pole switch fuse)	8 pcs Busbar 4 pcs Holder for common mode filters 8 pcs Support insulator 	68256771
	Three R8i modules side by side (6-pole switch fuse)	12 pcs Busbar 6 pcs Holder for common mode filters 15 pcs Support insulator 	68256780
	1 + 2 R8i modules in adjacent Rittal TS 8 cubicles (6-pole switch fuse)	12 pcs Busbar 6 pcs Holder for common mode filters 15 pcs Support insulator 	68260752

Upper and lower guides

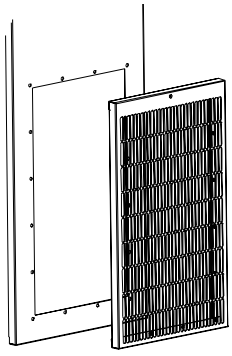
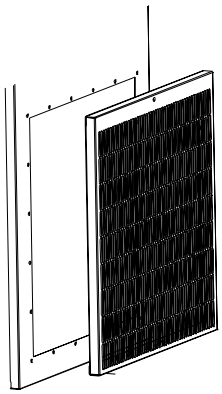
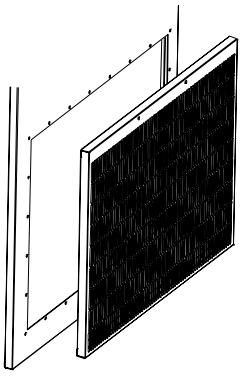
These parts guide the top and bottom of the module when it is being inserted into the cubicle.

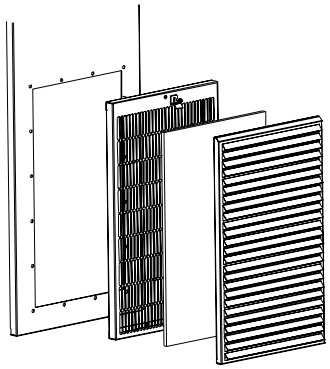
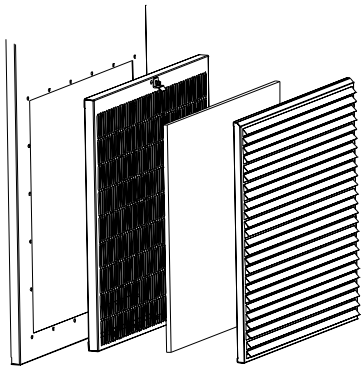
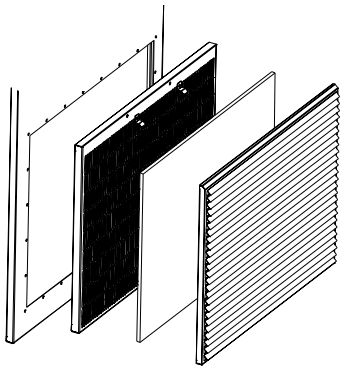
Guiding parts kits for R8i modules		
For…	**Contents of 1 kit**	**Order code**
Single R8i module	1 pc Lower guide 1 pc Upper guide 1 pc Upper guide, rear 2 pcs Crossmember 	68256836
Single R8i module in Rittal TS 8 cubicle	Kit #68256836 and 1 pc Floor plate 1 pc Mounting plate 2 pcs Air baffle 1 pcs EMC sealing, conductive (comes in 2 pieces) 	68283027
Two R8i modules side by side	2 pcs Lower guide 2 pcs Upper guide 2 pcs Upper guide, rear 2 pcs Crossmember 	68259517

Guiding parts kits for R8i modules		
For…	**Contents of 1 kit**	**Order code**
Two R8i modules in a Rittal TS 8 cubicle	Kit #68259517 and 2 pcs Floor plate 1 pc Mounting plate 2 pcs Air baffle 1 pcs EMC sealing, conductive (comes in 3 pieces)  	68283035
Three R8i modules side by side	3 pcs Lower guide 3 pcs Upper guide 3 pcs Upper guide, rear 1 pcs Crossmember, front 1 pcs Crossmember, rear  	68259541
1 + 2 R8i modules in adjacent Rittal TS 8 cubicles	68283027 + 68283035	68260833

Cabinet ventilation kits

These kits contain air inlet gratings and filters for different degrees of protection.

Cabinet ventilation kits for R8i modules			
Kit	**For…**	**Contents of 1 kit**	**Order code**
IP20 air inlet kit, unfiltered	400 mm wide cubicle. Aperture size: 274 × 526 mm (10.8” × 20.7”)	1 pc Grille (metallic) 	68239478
	600 mm wide cubicle. Aperture size: 471 × 504 mm (18.54” × 19.84”)	1 pc Grille (metallic) 	68239460
	800 mm wide cubicle. Aperture size: 671 × 522 mm (26.42“ × 20.54”)	1 pc Grille (metallic) 	68259827
	400 + 600 mm wide cubicles	68239478 + 68239460	68260817

Cabinet ventilation kits for R8i modules			
Kit	**For…**	**Contents of 1 kit**	**Order code**
IP42 air inlet kit, filtered	400 mm wide cubicle. Aperture size: 274 × 526 mm (10.8” × 20.7”)	1 pc Grille, inner (metallic) 1 pc Filter mat (Luftfilter airTex G150) 1 pc Grille, outer (plastic) 1 pc Fastener 	68239443
	600 mm wide cubicle. Aperture size: 471 × 504 mm (18.54” × 19.84”)	1 pc Grille, inner (metallic) 1 pc Filter mat (Luftfilter airTex G150) 1 pc Grille, outer (plastic) 1 pc Fastener 	68239451
	800 mm wide cubicle. Aperture size: 671 × 522 mm (26.42“ × 20.54”)	1 pc Grille, inner (metallic) 1 pc Filter mat (Luftfilter airTex G150) 1 pc Grille, outer (plastic) 2 pcs Fastener 	68259797
	400 + 800 mm wide cubicles	68239443 + 68239451	68260795

PPCS branching units for n×R8i inverter units

Inverter units consisting of parallel-connected frame R8i inverter modules require PPCS branching units for distribution of control signals to the modules. One branching unit can control up to four inverter modules.

There are two types available – the NPBU-42C is the basic unit; the APBU-44C also incorporates a datalogger and supports redundancy, enabling, in case of removal of one inverter module, continued operation using the remaining modules.

PPCS branching unit (Multiples of frame R8i)					
Inverter unit type ACS800-104…			**Quantity**	**Contents of 1 kit**	**Order code**
0770-3 1030-3	0910-5 1210-5	0870-7 1160-7	1	1 pc. APBU-44C branching unit & datalogger 2 pcs. 2000 mm fibre optic cables 2 pcs. 3000 mm fibre optic cables	*68242355
			1	1 pc. NPBU-42C branching unit 2 pcs. 2000 mm fibre optic cables 2 pcs. 3000 mm fibre optic cables	64349091
1540-3 2050-3	1820-5 2430-5	1740-7 2320-7	1	1 pc. APBU-44C branching unit & datalogger 4 pcs. 3000 mm fibre optic cables 4 pcs. 5000 mm fibre optic cables	*68242371
			1	1 pcs. NPBU-42C branching unit 4 pcs. 3000 mm fibre optic cables 4 pcs. 5000 mm fibre optic cables	64349139

*Check availability with ABB

Output (du/dt) filters for frame R2i to R7i inverter modules

For information on the usage of output (du/dt) filters, see the document *ACS800 MultiDrive; Planning the Electrical Installation* (3AFE 64783742, English).

Output (du/dt) filters for inverter modules										
Module type ACS800-104-…			**Qty**	**Type**	**Order code**	I_{RMS} **(A)**	L **(µH)**	**Power loss (W)**	**Cable size (mm^2)**	**Connection size**
0003-3 0004-3 0005-3 0006-3 0009-3 0011-3	0004-5 0005-5 0006-5 0009-5 0011-5 0016-5	0011-7	1	NOCH0016-60	58982784	15	150	110	0.2 … 10	M5
0016-3 0020-3	0020-5	0016-7 0020-7 0025-7	1	NOCH0030-60	58982792	28	140	167	0.5 … 16	M5
0025-3 0030-3 0040-3 0050-3	0025-5 0030-5 0040-5 0050-5 0060-5	0030-7 0040-7 0050-7 0060-7 0070-7	1	NOCH0070-60	58982806	65	115	210	10 … 35	M6
0060-3 0100-3 0120-3	0070-5 0100-5 0120-5 0140-5	0100-7 0120-7	1	NOCH0120-60	58982814	105	92	80	–	M8

Other options

See the *ACS800 Product Reference* (3AFE 64813340 [English]) for generic equipment for the ACS800 product family such as control panels, I/O options, application programs and PC tools.

Technical data

What this chapter contains

This chapter contains the technical data for the ACS800-104 inverter modules and associated optional equipment.

IEC ratings

Frame R2i to R7i

Inverter module type	Frame size	Nominal ratings		No-overload use	Light-overload use		Heavy-duty use	
		$I_{cont.max}$ A	I_{max} A	$P_{cont.max}$ kW	I_{2N} A	P_N kW	I_{2hd} A	P_{hd} kW
U_N = 400 V								
ACS800-104-0003-3	R2i	5.1	6.5	1.5	4.7	1.5	3.4	1.1
ACS800-104-0004-3	R2i	6.5	8.2	2.2	5.9	2.2	4.3	1.5
ACS800-104-0005-3	R2i	8.5	10.8	3	7.7	3.0	5.7	2.2
ACS800-104-0006-3	R2i	10.9	13.8	4	10.2	4.0	7.5	3.0
ACS800-104-0009-3	R2i	13.9	17.6	5.5	12.7	5.5	9.3	4.0
ACS800-104-0011-3	R3i	19	24	7.5	18	7.5	14	5.5
ACS800-104-0016-3	R3i	25	32	11	24	11	19	7.5
ACS800-104-0020-3	R3i	34	46	15	31	15	23	11
ACS800-104-0025-3	R4i	44	62	22	41	18.5	32	15
ACS800-104-0030-3	R4i	55	72	30	50	22	37	18.5
ACS800-104-0040-3	R5i	72	86	37	69	30	49	22
ACS800-104-0050-3	R5i	86	112	45	80	37	60	30
ACS800-104-0060-3	R5i	103	138	55	94	45	69	37
ACS800-104-0100-3	R7i	147	224	75	141	75	112	55
ACS800-104-0120-3	R7i	178	294	90	171	90	147	75
U_N = 500 V								
ACS800-104-0004-5	R2i	4.9	6.5	2.2	4.5	2.2	3.4	1.5
ACS800-104-0005-5	R2i	6.2	8.2	3	5.6	3.0	4.2	2.2
ACS800-104-0006-5	R2i	8.1	10.8	4	7.7	4.0	5.6	3.0
ACS800-104-0009-5	R2i	10.5	13.8	5.5	10.0	5.5	7.5	4.0
ACS800-104-0011-5	R2i	13.2	17.6	7.5	12.0	7.5	9.2	5.5
ACS800-104-0016-5	R3i	19	24	11	18	11	13	7.5
ACS800-104-0020-5	R3i	25	32	15	23	15	18	11
ACS800-104-0025-5	R3i	34	46	18.5	31	18.5	23	15
ACS800-104-0030-5	R4i	42	62	22	39	22	32	18.5
ACS800-104-0040-5	R4i	48	72	30	44	30	36	22
ACS800-104-0050-5	R5i	65	86	37	61	37	50	30
ACS800-104-0060-5	R5i	79	112	45	75	45	60	37
ACS800-104-0070-5	R5i	96	138	55	88	55	69	45
ACS800-104-0100-5	R6i	112	168	75	108	75	84	55
ACS800-104-0120-5	R7i	135	224	90	130	90	112	75
ACS800-104-0140-5	R7i	164	270	110	157	110	135	90
U_N = 690 V								
ACS800-104-0011-7	R4i	13	14	11	11.5	7.5	8.5	5.5

Inverter module type	Frame size	Nominal ratings		No-overload use	Light-overload use		Heavy-duty use	
		$I_{cont.max}$ A	I_{max} A	$P_{cont.max}$ kW	I_{2N} A	P_N kW	I_{2hd} A	P_{hd} kW
ACS800-104-0016-7	R4i	17	19	15	15	11	11	7.5
ACS800-104-0020-7	R4i	22	28	18.5	20	15	15	11
ACS800-104-0025-7	R4i	25	38	22	23	18.5	19	15
ACS800-104-0030-7	R4i	33	44	30	30	22	22	18.5
ACS800-104-0040-7	R4i	36	54	30	34	30	27	22
ACS800-104-0050-7	R5i	51	68	45	46	37	34	30
ACS800-104-0060-7	R5i	57	84	55	52	45	42	37
ACS800-104-0070-7	R6i	65	104	55	62	55	52	45
ACS800-104-0100-7	R7i	88	130	75	84	75	65	55
ACS800-104-0120-7	R7i	105	176	90	101	90	88	75

Frame R8i and multiples

Inverter unit type	Frame size	Inverter modules used	Nominal ratings		No-overload use	Light-overload use		Heavy-duty use	
			$I_{cont.max}$ A	I_{max} A	$P_{cont.max}$ kW	I_{2N} A	P_N kW	I_{2hd} A	P_{hd} kW
U_N = 400 V									
ACS800-104-0170-3	1×R8i	ACS800-104-0170-3	250	342	132	240	110	187	90
ACS800-104-0210-3	1×R8i	ACS800-104-0210-3	292	400	160	280	132	218	110
ACS800-104-0260-3	1×R8i	ACS800-104-0260-3	370	506	200	355	200	277	132
ACS800-104-0320-3	1×R8i	ACS800-104-0320-3	469	642	250	450	250	351	200
ACS800-104-0390-3	1×R8i	ACS800-104-0390-3	565	773	315	542	300	423	220
ACS800-104-0510-3	1×R8i	ACS800-104-0510-3	741	1014	400	711	400	554	315
ACS800-104-0770-3	2×R8i	ACS800-104-0390-3	1111	1521	630	1067	560	831	450
ACS800-104-1030-3	2×R8i	ACS800-104-0510-3	1452	1988	900	1394	710	1086	560
ACS800-104-1540-3	3×R8i	ACS800-104-0510-3	2156	2951	1250	2070	1120	1613	900
ACS800-104-2050-3	4×R8i	ACS800-104-0510-3	2845	3894	1600	2731	1600	2128	1120
U_N = 500 V									
ACS800-104-0210-5	1×R8i	ACS800-104-0210-5	250	363	160	240	160	187	110
ACS800-104-0260-5	1×R8i	ACS800-104-0260-5	315	457	200	302	200	236	132
ACS800-104-0320-5	1×R8i	ACS800-104-0320-5	365	530	250	350	250	273	160
ACS800-104-0400-5	1×R8i	ACS800-104-0400-5	455	660	315	437	315	340	200
ACS800-104-0460-5	1×R8i	ACS800-104-0460-5	525	762	355	504	355	393	250
ACS800-104-0610-5	1×R8i	ACS800-104-0610-5	700	1016	500	672	450	524	355
ACS800-104-0910-5	2×R8i	ACS800-104-0460-5	1050	1524	710	1008	710	785	500
ACS800-104-1210-5	2×R8i	ACS800-104-0610-5	1372	1991	900	1317	900	1026	710
ACS800-104-1820-5	3×R8i	ACS800-104-0610-5	2037	2956	1400	1956	1400	1524	1120
ACS800-104-2430-5	4×R8i	ACS800-104-0610-5	2688	3901	2000	2580	1800	2011	1400
U_N = 690 V									
ACS800-104-0210-7	1×R8i	ACS800-104-0210-7	170	254	160	163	160	127	90
ACS800-104-0260-7	1×R8i	ACS800-104-0260-7	215	322	200	206	200	161	132
ACS800-104-0320-7	1×R8i	ACS800-104-0320-7	289	432	250	277	250	216	160
ACS800-104-0400-7	1×R8i	ACS800-104-0400-7	336	503	315	323	315	251	200
ACS800-104-0440-7	1×R8i	ACS800-104-0440-7	382	571	355	367	355	286	250
ACS800-104-0580-7	1×R8i	ACS800-104-0580-7	486	727	450	467	450	364	315
ACS800-104-0870-7	2×R8i	ACS800-104-0440-7	729	1091	710	700	710	545	500
ACS800-104-1160-7	2×R8i	ACS800-104-0580-7	953	1425	900	914	900	713	630
ACS800-104-1740-7	3×R8i	ACS800-104-0580-7	1414	2116	1400	1358	1400	1058	900
ACS800-104-2320-7	4×R8i	ACS800-104-0580-7	1866	2792	1800	1792	1800	1396	1400

PDM-00184674

Symbols

Nominal ratings

$I_{cont.max}$ Continuous RMS output current. No overloadability at 40 °C.

I_{max} Maximum output current. Allowable for 10 seconds at start, otherwise as long as allowed by drive temperature. **Note:** Maximum motor shaft power is 150% P_{hd}.

Typical ratings for no-overload use

$P_{cont.max}$ Typical motor power. The power ratings apply to most IEC 34 motors at nominal voltage (400, 500 or 690 V).

Typical ratings for light-overload use (10% overloadability)

I_{2N} Continuous rms current. 10% overload is allowed for 1 minute every 5 minutes.

P_N Typical motor power. The power ratings apply to most IEC 34 motors at nominal voltage (400, 500 or 690 V).

Typical ratings for heavy-duty use (50% overloadability)

I_{2hd} Continuous rms current. 50% overload is allowed for 1 minute every 5 minutes.

P_{hd} Typical motor power. The power ratings apply to most IEC 34 motors at nominal voltage (400, 500 or 690 V).

Derating

The load capacity (current and power) decreases if the installation site altitude exceeds 1000 metres (3300 ft), or if the ambient temperature exceeds 40 °C (104 °F).

Temperature derating

In the temperature range +40 °C (+104 °F) to +50 °C (+122 °F) the rated output current is decreased 1 % for every additional 1 °C (1.8 °F). The output current is calculated by multiplying the current given in the rating table by the derating factor.

Example If the ambient temperature is +50 °C (+122 °F) the derating factor is 100% - 1 $\frac{\%}{°C}$ · 10 °C = 90 % or 0.90. The output current is then 0.90 · I_{2N} or 0.90 · I_{2hd}.

Note: $I_{cont.max}$ rating is not allowed above 40 °C (104 °F).

Altitude derating

In altitudes from 1000 to 4000 m (3300 to 13123 ft) above sea level, the derating is 1% for every 100 m (328 ft). For a more accurate derating, use the *Drive*Size PC tool. If the installation site is higher than 2000 m (6600 ft) above sea level, please contact your local ABB distributor or office for further information.

Dimensions, noise, DC capacitance

Inverter module/unit type	Frame size	Height	Width	Depth	Weight	Noise level	DC capacitance
		mm (in.)	mm (in.)	mm (in.)	kg (lbs)	dBA	µF
U_N = 400 V							
ACS800-104-0003-3	R2i	401 (15.79)	165 (6.50)	*193 (7.60)	9 (20)	62	350
ACS800-104-0004-3	R2i	401 (15.79)	165 (6.50)	*193 (7.60)	9 (20)	62	350
ACS800-104-0005-3	R2i	401 (15.79)	165 (6.50)	*193 (7.60)	9 (20)	62	350
ACS800-104-0006-3	R2i	401 (15.79)	165 (6.50)	*193 (7.60)	9 (20)	62	350
ACS800-104-0009-3	R2i	401 (15.79)	165 (6.50)	*193 (7.60)	9 (20)	62	350
ACS800-104-0011-3	R3i	466 (18.35)	173 (6.81)	*232 (9.13)	12 (26)	62	820
ACS800-104-0016-3	R3i	466 (18.35)	173 (6.81)	*232 (9.13)	12 (26)	62	820
ACS800-104-0020-3	R3i	466 (18.35)	173 (6.81)	*232 (9.13)	12 (26)	62	820
ACS800-104-0025-3	R4i	525 (20.67)	240 (9.45)	*252 (9.92)	15 (33)	62	1000
ACS800-104-0030-3	R4i	525 (20.67)	240 (9.45)	*252 (9.92)	15 (33)	62	1000
ACS800-104-0040-3	R5i	673 (26.50)	265 (10.43)	*276 (10.87)	23 (51)	65	2000
ACS800-104-0050-3	R5i	673 (26.50)	265 (10.43)	*276 (10.87)	23 (51)	65	2000
ACS800-104-0060-3	R5i	673 (26.50)	265 (10.43)	*276 (10.87)	23 (51)	65	2400
ACS800-104-0100-3	R7i	**744 (29.29)	**228 (8.98)	**367 (14.45)	**37 (82)	64	3300
ACS800-104-0120-3	R7i	**744 (29.29)	**228 (8.98)	**367 (14.45)	**37 (82)	64	4700
ACS800-104-0170-3	1×R8i	1397 (55.00)	245 (9.65)	596 (23.46)	150 (330)	72	8200
ACS800-104-0210-3	1×R8i	1397 (55.00)	245 (9.65)	596 (23.46)	150 (330)	72	8200
ACS800-104-0260-3	1×R8i	1397 (55.00)	245 (9.65)	596 (23.46)	150 (330)	72	8200
ACS800-104-0320-3	1×R8i	1397 (55.00)	245 (9.65)	596 (23.46)	150 (330)	72	10250
ACS800-104-0390-3	1×R8i	1397 (55.00)	245 (9.65)	596 (23.46)	150 (330)	72	12300
ACS800-104-0510-3	1×R8i	1397 (55.00)	245 (9.65)	596 (23.46)	150 (330)	72	14350
ACS800-104-0770-3	2×R8i	***1397 (55.00)	***245 (9.65)	***596 (23.46)	***150 (330)	74	24600
ACS800-104-1030-3	2×R8i	***1397 (55.00)	***245 (9.65)	***596 (23.46)	***150 (330)	74	28700
ACS800-104-1540-3	3×R8i	***1397 (55.00)	***245 (9.65)	***596 (23.46)	***150 (330)	76	43050
ACS800-104-2050-3	4×R8i	***1397 (55.00)	***245 (9.65)	***596 (23.46)	***150 (330)	76	57400
U_N = 500 V							
ACS800-104-0004-5	R2i	401 (15.79)	165 (6.50)	*193 (7.60)	9 (20)	62	350
ACS800-104-0005-5	R2i	401 (15.79)	165 (6.50)	*193 (7.60)	9 (20)	62	350
ACS800-104-0006-5	R2i	401 (15.79)	165 (6.50)	*193 (7.60)	9 (20)	62	350
ACS800-104-0009-5	R2i	401 (15.79)	165 (6.50)	*193 (7.60)	9 (20)	62	350
ACS800-104-0011-5	R2i	401 (15.79)	165 (6.50)	*193 (7.60)	9 (20)	62	350
ACS800-104-0016-5	R3i	466 (18.35)	173 (6.81)	*232 (9.13)	12 (26)	62	820
ACS800-104-0020-5	R3i	466 (18.35)	173 (6.81)	*232 (9.13)	12 (26)	62	820
ACS800-104-0025-5	R3i	466 (18.35)	173 (6.81)	*232 (9.13)	12 (26)	62	820
ACS800-104-0030-5	R4i	525 (20.67)	240 (9.45)	*252 (9.92)	15 (33)	62	1000
ACS800-104-0040-5	R4i	525 (20.67)	240 (9.45)	*252 (9.92)	15 (33)	62	1000
ACS800-104-0050-5	R5i	673 (26.50)	265 (10.43)	*276 (10.87)	23 (51)	65	2000
ACS800-104-0060-5	R5i	673 (26.50)	265 (10.43)	*276 (10.87)	23 (51)	65	2000
ACS800-104-0070-5	R5i	673 (26.50)	265 (10.43)	*276 (10.87)	23 (51)	65	2400
ACS800-104-0100-5	R6i	**744 (29.29)	**228 (8.98)	**367 (14.45)	**37 (82)	64	2270
ACS800-104-0120-5	R7i	**744 (29.29)	**228 (8.98)	**367 (14.45)	**37 (82)	64	4530
ACS800-104-0140-5	R7i	**744 (29.29)	**228 (8.98)	**367 (14.45)	**37 (82)	64	4530
ACS800-104-0210-5	1×R8i	1397 (55.00)	245 (9.65)	596 (23.46)	150 (330)	72	8200
ACS800-104-0260-5	1×R8i	1397 (55.00)	245 (9.65)	596 (23.46)	150 (330)	72	8200
ACS800-104-0320-5	1×R8i	1397 (55.00)	245 (9.65)	596 (23.46)	150 (330)	72	8200
ACS800-104-0400-5	1×R8i	1397 (55.00)	245 (9.65)	596 (23.46)	150 (330)	72	10250
ACS800-104-0460-5	1×R8i	1397 (55.00)	245 (9.65)	596 (23.46)	150 (330)	72	12300

Inverter module/unit type	Frame size	Height	Width	Depth	Weight	Noise level	DC capacitance
		mm (in.)	mm (in.)	mm (in.)	kg (lbs)	dBA	µF
ACS800-104-0610-5	1×R8i	1397 (55.00)	245 (9.65)	596 (23.46)	150 (330)	72	14350
ACS800-104-0910-5	2×R8i	***1397 (55.00)	***245 (9.65)	***596 (23.46)	***150 (330)	74	24600
ACS800-104-1210-5	2×R8i	***1397 (55.00)	***245 (9.65)	***596 (23.46)	***150 (330)	74	28700
ACS800-104-1820-5	3×R8i	***1397 (55.00)	***245 (9.65)	***596 (23.46)	***150 (330)	76	43050
ACS800-104-2430-5	4×R8i	***1397 (55.00)	***245 (9.65)	***596 (23.46)	***150 (330)	76	57400
U_N = 690 V							
ACS800-104-0011-7	R4i	525 (20.67)	240 (9.45)	*252 (9.92)	15 (33)	62	670
ACS800-104-0016-7	R4i	525 (20.67)	240 (9.45)	*252 (9.92)	15 (33)	62	670
ACS800-104-0020-7	R4i	525 (20.67)	240 (9.45)	*252 (9.92)	15 (33)	62	670
ACS800-104-0025-7	R4i	525 (20.67)	240 (9.45)	*252 (9.92)	15 (33)	62	670
ACS800-104-0030-7	R4i	525 (20.67)	240 (9.45)	*252 (9.92)	15 (33)	62	670
ACS800-104-0040-7	R4i	525 (20.67)	240 (9.45)	*252 (9.92)	15 (33)	62	670
ACS800-104-0050-7	R5i	673 (26.50)	265 (10.43)	*276 (10.87)	23 (51)	65	1330
ACS800-104-0060-7	R5i	673 (26.50)	265 (10.43)	*276 (10.87)	23 (51)	65	1330
ACS800-104-0070-7	R6i	**744 (29.29)	**228 (8.98)	**367 (14.45)	**37 (82)	64	1570
ACS800-104-0100-7	R7i	**744 (29.29)	**228 (8.98)	**367 (14.45)	**37 (82)	64	2200
ACS800-104-0120-7	R7i	**744 (29.29)	**228 (8.98)	**367 (14.45)	**37 (82)	64	2200
ACS800-104-0210-7	1×R8i	1397 (55.00)	245 (9.65)	596 (23.46)	150 (330)	72	4600
ACS800-104-0260-7	1×R8i	1397 (55.00)	245 (9.65)	596 (23.46)	150 (330)	72	4600
ACS800-104-0320-7	1×R8i	1397 (55.00)	245 (9.65)	596 (23.46)	150 (330)	72	6130
ACS800-104-0400-7	1×R8i	1397 (55.00)	245 (9.65)	596 (23.46)	150 (330)	72	6130
ACS800-104-0440-7	1×R8i	1397 (55.00)	245 (9.65)	596 (23.46)	150 (330)	72	7670
ACS800-104-0580-7	1×R8i	1397 (55.00)	245 (9.65)	596 (23.46)	150 (330)	72	9200
ACS800-104-0870-7	2×R8i	***1397 (55.00)	***245 (9.65)	***596 (23.46)	***150 (330)	74	15330
ACS800-104-1160-7	2×R8i	***1397 (55.00)	***245 (9.65)	***596 (23.46)	***150 (330)	74	18400
ACS800-104-1740-7	3×R8i	***1397 (55.00)	***245 (9.65)	***596 (23.46)	***150 (330)	76	27600
ACS800-104-2320-7	4×R8i	***1397 (55.00)	***245 (9.65)	***596 (23.46)	***150 (330)	76	36800

*Excluding control panel (optional)
**Excluding cooling fan. Refer to *Dimensional drawings*
***Single module only

Power loss and cooling characteristics

See the dimensional drawings for free space requirements.

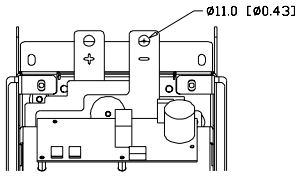
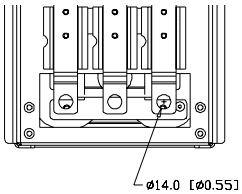
Inverter module/ unit type	Frame size	Power loss	Nominal air flow	Minimum effective area of air inlet		Minimum effective area of air outlet		Max. pressure drop of cabinet at nominal air flow
				unfiltered	with Luftfilter/ airTex G150	unfiltered	with Luftfilter/ airTex G150	
		W (Btu/h)	m^3/h (ft^3/min)	cm^2 (in^2)	cm^2 (in^2)	cm^2 (in^2)	cm^2 (in^2)	Pa
U_N = 400 V								
ACS800-104-0003-3	R2i	80 (280)	35 (21)	100 (16)	200 (31)	160 (25)	320 (50)	12
ACS800-104-0004-3	R2i	100 (340)	35 (21)	100 (16)	200 (31)	160 (25)	320 (50)	12
ACS800-104-0005-3	R2i	110 (380)	35 (21)	100 (16)	200 (31)	160 (25)	320 (50)	12
ACS800-104-0006-3	R2i	130 (450)	35 (21)	100 (16)	200 (31)	160 (25)	320 (50)	12
ACS800-104-0009-3	R2i	160 (550)	35 (21)	100 (16)	200 (31)	160 (25)	320 (50)	12
ACS800-104-0011-3	R3i	200 (680)	69 (41)	200 (31)	400 (62)	320 (50)	640 (99)	12
ACS800-104-0016-3	R3i	270 (920)	69 (41)	200 (31)	400 (62)	320 (50)	640 (99)	12
ACS800-104-0020-3	R3i	350 (1200)	69 (41)	200 (31)	400 (62)	320 (50)	640 (99)	12
ACS800-104-0025-3	R4i	420 (1440)	103 (61)	300 (47)	600 (93)	480 (74)	960 (149)	12
ACS800-104-0030-3	R4i	490 (1680)	103 (61)	300 (47)	600 (93)	480 (74)	960 (149)	12
ACS800-104-0040-3	R5i	650 (2220)	168 (99)	400 (62)	800 (124)	640 (99)	1280 (198)	17
ACS800-104-0050-3	R5i	790 (2700)	168 (99)	400 (62)	800 (124)	640 (99)	1280 (198)	17
ACS800-104-0060-3	R5i	950 (3250)	168 (99)	400 (62)	800 (124)	640 (99)	1280 (198)	17
ACS800-104-0100-3	R7i	1500 (5120)	480 (283)	325 (50)	650 (101)	520 (81)	1040 (161)	67
ACS800-104-0120-3	R7i	1800 (6150)	480 (283)	325 (50)	650 (101)	520 (81)	1040 (161)	67
ACS800-104-0170-3	1×R8i	2200 (7510)	1280 (750)	575 (90)	1150 (180)	920 (140)	1840 (290)	150
ACS800-104-0210-3	1×R8i	2700 (9220)	1280 (750)	575 (90)	1150 (180)	920 (140)	1840 (290)	150
ACS800-104-0260-3	1×R8i	3700 (12700)	1280 (750)	575 (90)	1150 (180)	920 (140)	1840 (290)	150
ACS800-104-0320-3	1×R8i	4500 (15400)	1280 (750)	575 (90)	1150 (180)	920 (140)	1840 (290)	150
ACS800-104-0390-3	1×R8i	5800 (19800)	1280 (750)	575 (90)	1150 (180)	920 (140)	1840 (290)	150
ACS800-104-0510-3	1×R8i	7900 (27000)	1280 (750)	575 (90)	1150 (180)	920 (140)	1840 (290)	150
ACS800-104-0770-3	2×R8i	11400 (38900)	2560 (1510)	960 (150)	1920 (295)	1536 (240)	3072 (475)	180
ACS800-104-1030-3	2×R8i	15300 (52300)	2560 (1510)	960 (150)	1920 (295)	1536 (240)	3072 (475)	180
ACS800-104-1540-3	3×R8i	22500 (76900)	3840 (2260)	1440 (225)	2880 (445)	2304 (355)	4608 (715)	180
ACS800-104-2050-3	4×R8i	29500 (101000)	5120 (3010)	1920 (295)	3840 (595)	3072 (475)	6144 (950)	180
U_N = 500 V								
ACS800-104-0004-5	R2i	100 (340)	35 (21)	100 (16)	200 (31)	160 (25)	320 (50)	12
ACS800-104-0005-5	R2i	110 (380)	35 (21)	100 (16)	200 (31)	160 (25)	320 (50)	12
ACS800-104-0006-5	R2i	130 (450)	35 (21)	100 (16)	200 (31)	160 (25)	320 (50)	12
ACS800-104-0009-5	R2i	160 (550)	35 (21)	100 (16)	200 (31)	160 (25)	320 (50)	12
ACS800-104-0011-5	R2i	200 (680)	35 (21)	100 (16)	200 (31)	160 (25)	320 (50)	12
ACS800-104-0016-5	R3i	270 (920)	69 (41)	200 (31)	400 (62)	320 (50)	640 (99)	12
ACS800-104-0020-5	R3i	350 (1200)	69 (41)	200 (31)	400 (62)	320 (50)	640 (99)	12
ACS800-104-0025-5	R3i	420 (1440)	69 (41)	200 (31)	400 (62)	320 (50)	640 (99)	12
ACS800-104-0030-5	R4i	490 (1680)	103 (61)	300 (47)	600 (93)	480 (74)	960 (149)	12
ACS800-104-0040-5	R4i	650 (2220)	103 (61)	300 (47)	600 (93)	480 (74)	960 (149)	12
ACS800-104-0050-5	R5i	790 (2700)	168 (99)	400 (62)	800 (124)	640 (99)	1280 (198)	17
ACS800-104-0060-5	R5i	950 (3250)	168 (99)	400 (62)	800 (124)	640 (99)	1280 (198)	17
ACS800-104-0070-5	R5i	1150 (3930)	168 (99)	400 (62)	800 (124)	640 (99)	1280 (198)	17
ACS800-104-0100-5	R6i	1500 (5120)	480 (283)	325 (50)	650 (101)	520 (81)	1040 (161)	67
ACS800-104-0120-5	R7i	1800 (6150)	480 (283)	325 (50)	650 (101)	520 (81)	1040 (161)	67
ACS800-104-0140-5	R7i	2100 (7170)	480 (283)	325 (50)	650 (101)	520 (81)	1040 (161)	67
ACS800-104-0210-5	1×R8i	2500 (8540)	1280 (750)	575 (90)	1150 (180)	920 (140)	1840 (290)	150

Inverter module/ unit type	Frame size	Power loss	Nominal air flow	Minimum effective area of air inlet		Minimum effective area of air outlet		Max. pressure drop of cabinet at nominal air flow
				unfiltered	with Luftfilter/ airTex G150	unfiltered	with Luftfilter/ airTex G150	
		W (Btu/h)	m^3/h (ft^3/min)	cm^2 (in^2)	cm^2 (in^2)	cm^2 (in^2)	cm^2 (in^2)	Pa
ACS800-104-0260-5	1×R8i	3300 (11300)	1280 (750)	575 (90)	1150 (180)	920 (140)	1840 (290)	150
ACS800-104-0320-5	1×R8i	3900 (13300)	1280 (750)	575 (90)	1150 (180)	920 (140)	1840 (290)	150
ACS800-104-0400-5	1×R8i	4700 (16100)	1280 (750)	575 (90)	1150 (180)	920 (140)	1840 (290)	150
ACS800-104-0460-5	1×R8i	5700 (19500)	1280 (750)	575 (90)	1150 (180)	920 (140)	1840 (290)	150
ACS800-104-0610-5	1×R8i	7700 (26300)	1280 (750)	575 (90)	1150 (180)	920 (140)	1840 (290)	150
ACS800-104-0910-5	2×R8i	11300 (38600)	2560 (1510)	960 (150)	1920 (295)	1536 (240)	3072 (475)	180
ACS800-104-1210-5	2×R8i	14900 (50900)	2560 (1510)	960 (150)	1920 (295)	1536 (240)	3072 (475)	180
ACS800-104-1820-5	3×R8i	22000 (75100)	3840 (2260)	1440 (225)	2880 (445)	2304 (355)	4608 (715)	180
ACS800-104-2430-5	4×R8i	28900 (98700)	5120 (3010)	1920 (295)	3840 (595)	3072 (475)	6144 (950)	180
U_N = 690 V								
ACS800-104-0011-7	R4i	300 (1030)	103 (61)	300 (47)	600 (93)	480 (74)	960 (149)	12
ACS800-104-0016-7	R4i	340 (1160)	103 (61)	300 (47)	600 (93)	480 (74)	960 (149)	12
ACS800-104-0020-7	R4i	440 (1500)	103 (61)	300 (47)	600 (93)	480 (74)	960 (149)	12
ACS800-104-0025-7	R4i	530 (1810)	103 (61)	300 (47)	600 (93)	480 (74)	960 (149)	12
ACS800-104-0030-7	R4i	610 (2080)	103 (61)	300 (47)	600 (93)	480 (74)	960 (149)	12
ACS800-104-0040-7	R4i	690 (2360)	103 (61)	300 (47)	600 (93)	480 (74)	960 (149)	12
ACS800-104-0050-7	R5i	840 (2870)	168 (99)	400 (62)	800 (124)	640 (99)	1280 (198)	17
ACS800-104-0060-7	R5i	1010 (3450)	168 (99)	400 (62)	800 (124)	640 (99)	1280 (198)	17
ACS800-104-0070-7	R6i	1100 (3760)	480 (283)	325 (50)	650 (101)	520 (81)	1040 (161)	67
ACS800-104-0100-7	R7i	1500 (5120)	480 (283)	325 (50)	650 (101)	520 (81)	1040 (161)	67
ACS800-104-0120-7	R7i	1800 (6150)	480 (283)	325 (50)	650 (101)	520 (81)	1040 (161)	67
ACS800-104-0210-7	1×R8i	3300 (11300)	1280 (750)	575 (90)	1150 (180)	920 (140)	1840 (290)	150
ACS800-104-0260-7	1×R8i	4000 (13700)	1280 (750)	575 (90)	1150 (180)	920 (140)	1840 (290)	150
ACS800-104-0320-7	1×R8i	4600 (15700)	1280 (750)	575 (90)	1150 (180)	920 (140)	1840 (290)	150
ACS800-104-0400-7	1×R8i	5200 (17800)	1280 (750)	575 (90)	1150 (180)	920 (140)	1840 (290)	150
ACS800-104-0440-7	1×R8i	6800 (23200)	1280 (750)	575 (90)	1150 (180)	920 (140)	1840 (290)	150
ACS800-104-0580-7	1×R8i	7400 (25300)	1280 (750)	575 (90)	1150 (180)	920 (140)	1840 (290)	150
ACS800-104-0870-7	2×R8i	12900 (44100)	2560 (1510)	960 (150)	1920 (295)	1536 (240)	3072 (475)	180
ACS800-104-1160-7	2×R8i	14400 (49200)	2560 (1510)	960 (150)	1920 (295)	1536 (240)	3072 (475)	180
ACS800-104-1740-7	3×R8i	21300 (72800)	3840 (2260)	1440 (225)	2880 (445)	2304 (355)	4608 (715)	180
ACS800-104-2320-7	4×R8i	28100 (96000)	5120 (3010)	1920 (295)	3840 (595)	3072 (475)	6144 (950)	180

Cable terminals

DC input and motor cable terminal sizes, accepted cable diameters and tightening torques are given below.

Frame size	UDC+, UDC–, U2, V2, W2						Earthing PE			
	Max. wire size		Cable Ø		Tightening torque		Maximum wire size		Tightening torque	
	mm^2	AWG	mm	in.	Nm	lbf.ft	mm^2	AWG	Nm	lbf.ft
R2i	16*	6 AWG	21	0.83	1.2...1.5	0.9…1.1	10	8	1.5	1.1
R3i	16*	6 AWG	29	1.14	1.2...1.5	0.9...1.1	10	8	1.5	1.1
R4i	25	4 AWG	35	1.38	2…4	1.5…3.0	16	5	3.0	2.2
R5i	70	2/0 AWG	35	1.38	15	11.1	70	2/0	15	11.1

Frame size	DC terminals	Motor output
R6i R7i		
R8i	M12 Tightening torque: 50 Nm (37 lbf.ft) Max. intrusion into module: 20 mm (0.8”).	Busbars to quick connector: M12. Tightening torque: 50 Nm (37 lbf.ft) Busbars to support insulators: M8. Tightening torque: 9 Nm (6.5 lbf.ft)

* 16 mm^2 rigid solid cable, 10 mm^2 flexible stranded cable

Input power connection

Voltage	510…560 V DC for 400 V units 510…675 V DC for 500 V units 710…930 V DC for 690 V units

Motor connection

Voltage (U_2)	0 to U_1, 3-phase symmetrical, U_{max} at the field weakening point
Frequency	DTC mode: 0 to 3.2 · f_{FWP}. Maximum frequency 300 Hz. $f_{FWP} = \frac{U_{Nmains}}{U_{Nmotor}} \cdot f_{Nmotor}$ f_{FWP}: frequency at field weakening point; U_{Nmains}: mains (input power) voltage; U_{Nmotor}: rated motor voltage; f_{Nmotor}: rated motor frequency
Frequency resolution	0.01 Hz
Current	See *IEC ratings* starting on page 109.
Power limit	1.5 · P_{hd}
Field weakening point	8 to 300 Hz
Switching frequency	3 kHz (average). In 690 V units 2 kHz (average).

Maximum recommended motor cable length

Sizing method	Max. motor cable length	
	DTC control	Scalar control
according to I_{2N} and I_{2hd}	R2i to R3: 100 m (328 ft) R4i to R5i: 300 m (984 ft)	R2i: 150 m (492 ft) R3i to R5i: 300 m (984 ft)
according to $I_{cont.max}$ in ambient temperatures below 30 °C (86 °F)		
according to $I_{cont.max}$ in ambient temperatures above 30 °C (86 °F)	R2i: 50 m (164 ft) R3i and R4i: 100 m (328 ft) R5i: 150 m (492 ft)	

Note: With cables longer than 100 m, the EMC Directive requirements may not be fulfilled.

Efficiency

Approximately 98 % at nominal power level

Degree of protection

IP 00

Ambient conditions

Environmental limits for the drive are given below. The drive is to be used in a heated, indoor, controlled environment.

	Operation installed for stationary use	**Storage** in the protective package	**Transportation** in the protective package
Installation site altitude	0 to 4000 m (13123 ft) above sea level [above 1000 m (3281 ft), see *Derating* on page 111].	-	-
Air temperature	-15 to +50 °C (5 to 122 °F). No frost allowed. See *Derating* on page 111.	-40 to +70 °C (-40 to +158 °F)	-40 to +70 °C (-40 to +158 °F)
Relative humidity	5 to 95%	Max. 95%	Max. 95%
	No condensation allowed. Maximum allowed relative humidity is 60% in the presence of corrosive gases.		
Contamination levels (IEC 60721-3-3, IEC 60721-3-2, IEC 60721-3-1)	No conductive dust allowed.		
	Boards without coating: Chemical gases: Class 3C1 Solid particles: Class 3S2 **Boards with coating:** Chemical gases: Class 3C2 Solid particles: Class 3S2	**Boards without coating:** Chemical gases: Class 1C2 Solid particles: Class 1S3 **Boards with coating:** Chemical gases: Class 1C2 Solid particles: Class 1S3	**Boards without coating:** Chemical gases: Class 2C2 Solid particles: Class 2S2 **Boards with coating:** Chemical gases: Class 2C2 Solid particles: Class 2S2
Atmospheric pressure	70 to 106 kPa 0.7 to 1.05 atmospheres	70 to 106 kPa 0.7 to 1.05 atmospheres	60 to 106 kPa 0.6 to 1.05 atmospheres
Vibration (IEC 60068-2)	Max. 1 mm (0.04 in.) (5 to 13.2 Hz), max. 7 m/s^2 (23 ft/s^2) (13.2 to 100 Hz) sinusoidal	Max. 1 mm (0.04 in.) (5 to 13.2 Hz), max. 7 m/s^2 (23 ft/s^2) (13.2 to 100 Hz) sinusoidal	Max. 3.5 mm (0.14 in.) (2 to 9 Hz), max. 15 m/s^2 (49 ft/s^2) (9 to 200 Hz) sinusoidal
Shock (IEC 60068-2-29)	Not allowed	Max. 100 m/s^2 (330 ft./s^2), 11 ms	Max. 100 m/s^2 (330 ft./s^2), 11 ms
Free fall	Not allowed	250 mm (10 in.) for weight under 100 kg (220 lb) 100 mm (4 in.) for weight over 100 kg (220 lb)	250 mm (10 in.) for weight under 100 kg (220 lb) 100 mm (4 in.) for weight over 100 kg (220 lb)

Materials

Module	• PC/ABS 2.5 mm, colour NCS 1502-Y (RAL 90021 / PMS 420 C) • hot-dip zinc coated steel sheet 1.5 to 2 mm, thickness of coating 100 micrometres • cast aluminium AlSi (R2i and R3i) • extruded aluminium AlSi (R4i and R5i)
Packaging	Corrugated cardboard (frames R2i to R5i and option modules), expanded polystyrene. Plastic covering of the package: PE-LD, bands PP or steel.
Disposal	The drive contains raw materials that should be recycled to preserve energy and natural resources. The package materials are environmentally compatible and recyclable. All metal parts can be recycled. The plastic parts can either be recycled or burned under controlled circumstances, according to local regulations. Most recyclable parts are marked with recycling marks. If recycling is not feasible, all parts excluding electrolytic capacitors and printed circuit boards can be landfilled. The DC capacitors (C1-1 to C1-x) contain electrolyte and the printed circuit boards contain lead, both of which will be classified as hazardous waste within the EU. They must be removed and handled according to local regulations. For further information on environmental aspects and more detailed recycling instructions, please contact your local ABB distributor.

Applicable standards

	The drive complies with the following standards. The compliance with the European Low Voltage Directive is verified according to standards EN 50178 and EN 60204-1.
• EN 50178 (1997)	Electronic equipment for use in power installations
• EN 60204-1 (1997)	Safety of machinery. Electrical equipment of machines. Part 1: General requirements. *Provisions for compliance:* The final assembler of the machine is responsible for installing - an emergency-stop device - a supply disconnecting device.
• EN 60529: 1991 (IEC 529), IEC 60664-1 (1992)	Degrees of protection provided by enclosures (IP code)
• EN 61800-3 (1996) + Amendment A11 (2000)	EMC product standard including specific test methods
• UL 508C	UL Standard for Safety, Power Conversion Equipment, second edition
• CSA C22.2 No. 14-95	Industrial control equipment

Equipment warranty and liability

The manufacturer warrants the equipment supplied against defects in design, materials and workmanship for a period of twelve (12) months after installation or twenty-four (24) months from date of manufacturing, whichever first occurs. The local ABB office or distributor may grant a warranty period different to the above and refer to local terms of liability as defined in the supply contract.

The manufacturer is not responsible for

- any costs resulting from a failure if the installation, commissioning, repair, alternation, or ambient conditions of the drive do not fulfil the requirements specified in the documentation delivered with the unit and other relevant documentation.
- units subjected to misuse, negligence or accident
- units comprised of materials provided or designs stipulated by the purchaser.

In no event shall the manufacturer, its suppliers or subcontractors be liable for special, indirect, incidental or consequential damages, losses or penalties.

If you have any questions concerning your ABB drive, please contact the local distributor or ABB office. The technical data, information and specifications are valid at the time of printing. The manufacturer reserves the right to modifications without prior notice.

Auxiliary power consumptions

Circuit boards

Type	U_n V DC	U_n V AC	f Hz	I_n A	I_{max} A
AGPS-11C	–	230	50	0.1	–
	–	115	60	0.2	–
AGPS-21C	–	230	50	0.3	–
		115	60	0.6	–
APBU-44	24	–	–	0.2	–
ASFC-21C	–	230	50	0.04	–
	–	115	60	0.08	–
NCHM-21	–	230	50	1.0	2.0
NCHM-22	–	115	60	2.0	4.0
NGPS-01	–	230	50/60	0.16	6.0 (1/2 cycle)
	–	115	60	0.32	6.0 (1/2 cycle)
NPBU-42	24	–	–	0.2	0.235
RDCU-02	24	–	–	0.25	1.2

Cooling fans

Frame size	Type	U_n V AC	f Hz	I_n A	I_{start} A
R7i	G2E140-P151-09	230	50	0.7	1.4
			60	0.9	1.8
	G2E140-AI32-ABB	115	60	1.8	3.6
R8i	D2D160-BE02-11	400	50	1.3	
		320	60	1.3	

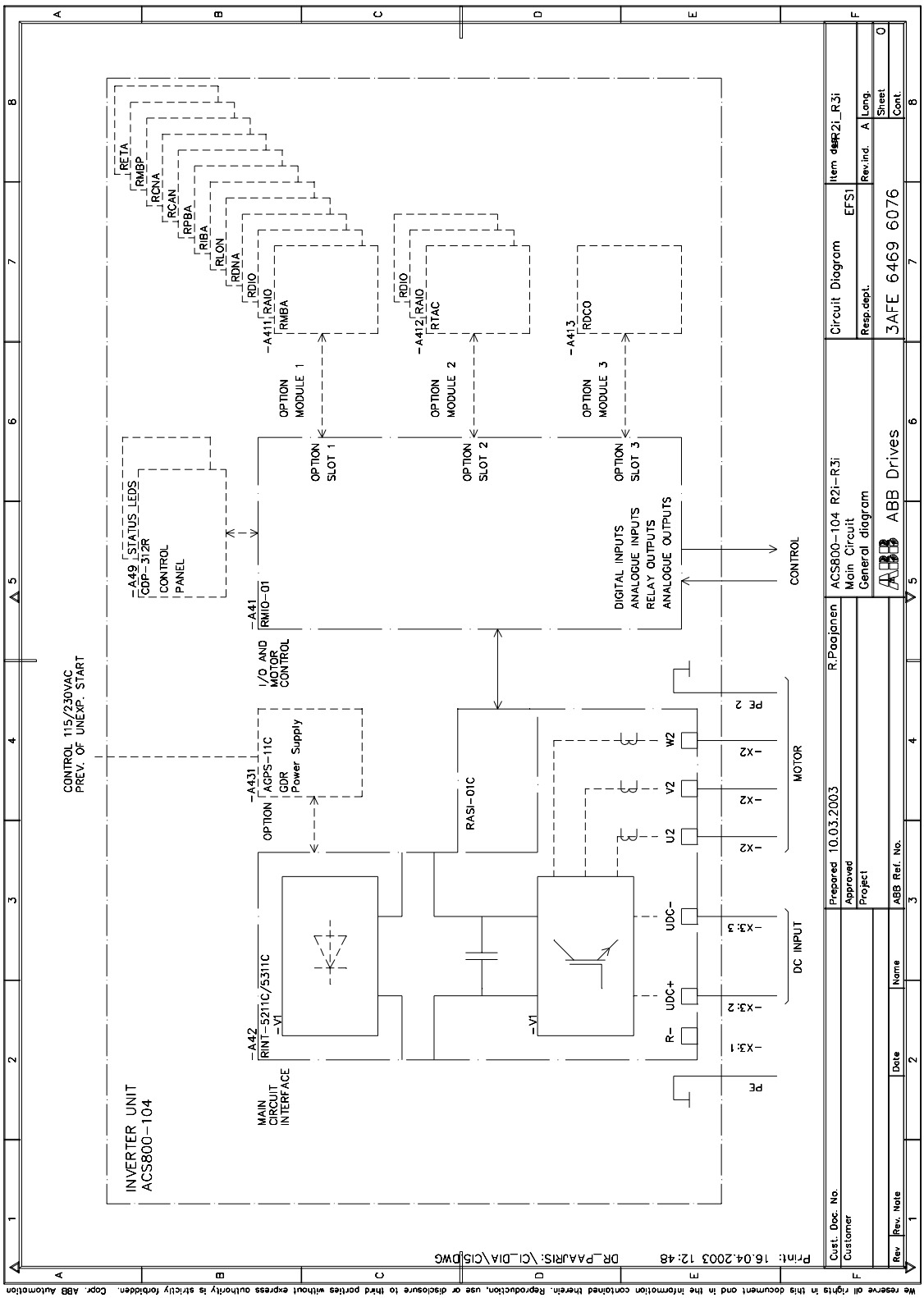
Circuit diagrams

What this chapter contains

This chapter contains the block diagrams of the ACS800-104 inverter modules, as well as example connection diagrams for the whole inverter unit.

Frame R2i to R5i

R2i/R3i – Block diagram



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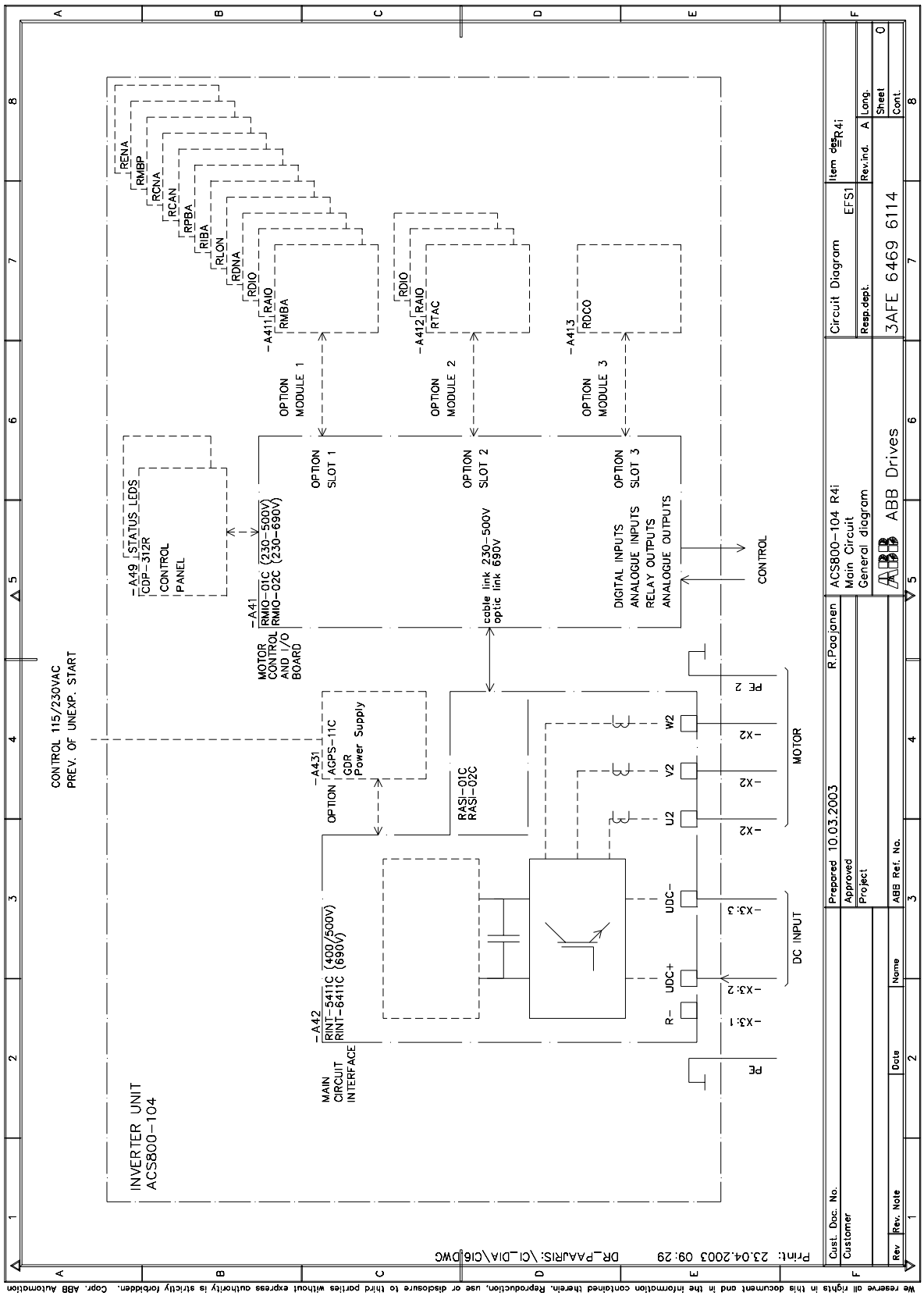
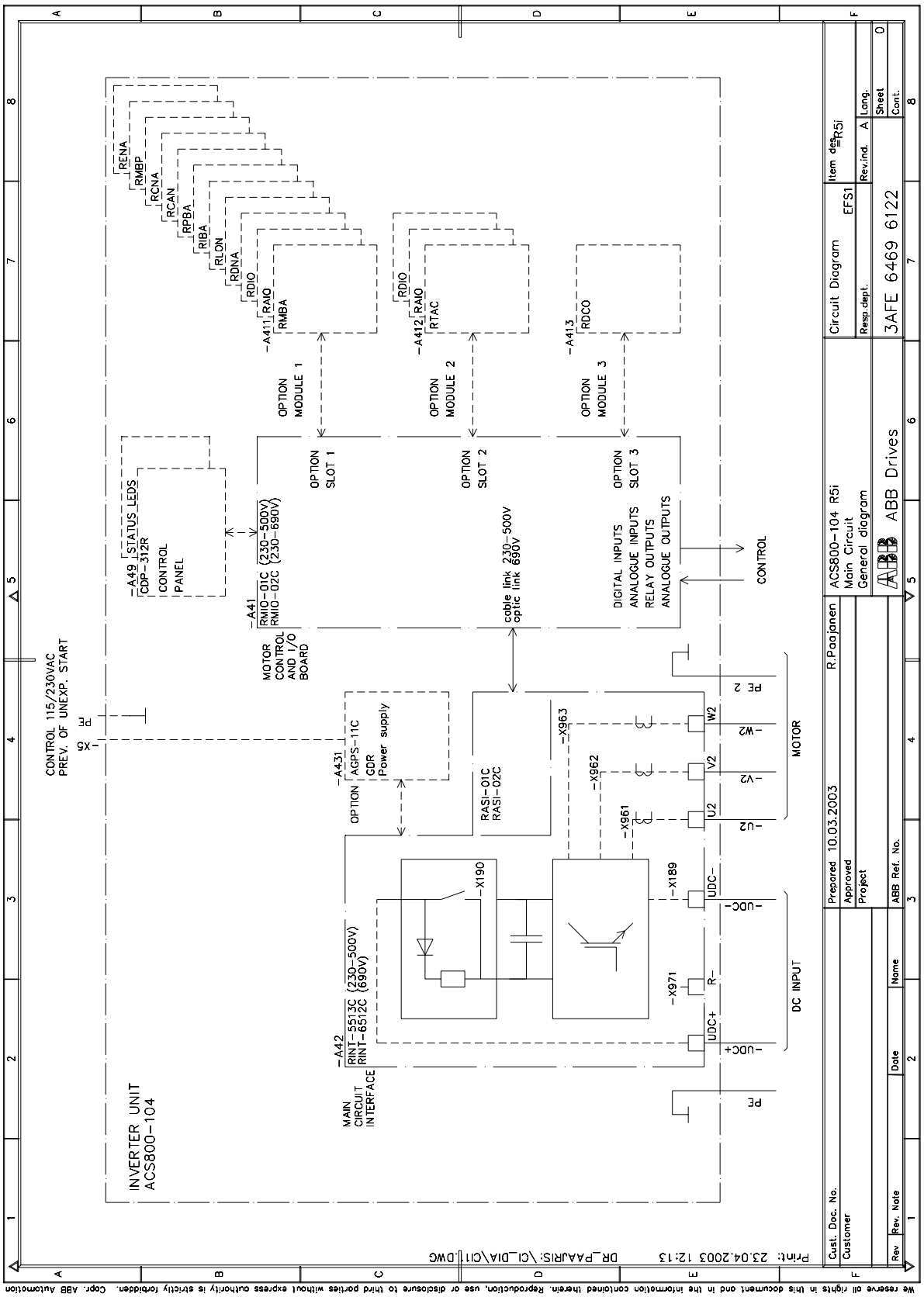
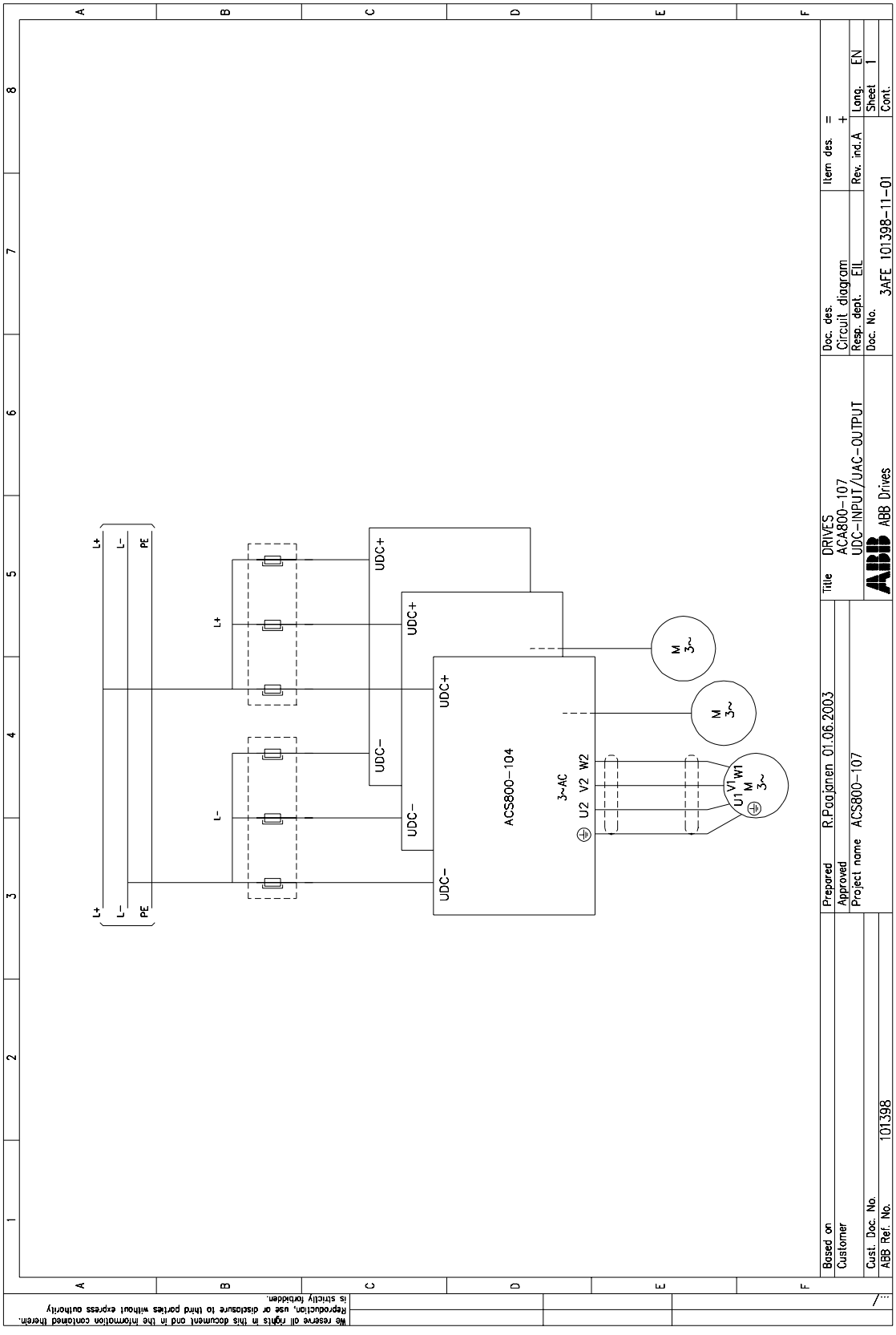
R4i – Block diagram



R5i – Block diagram

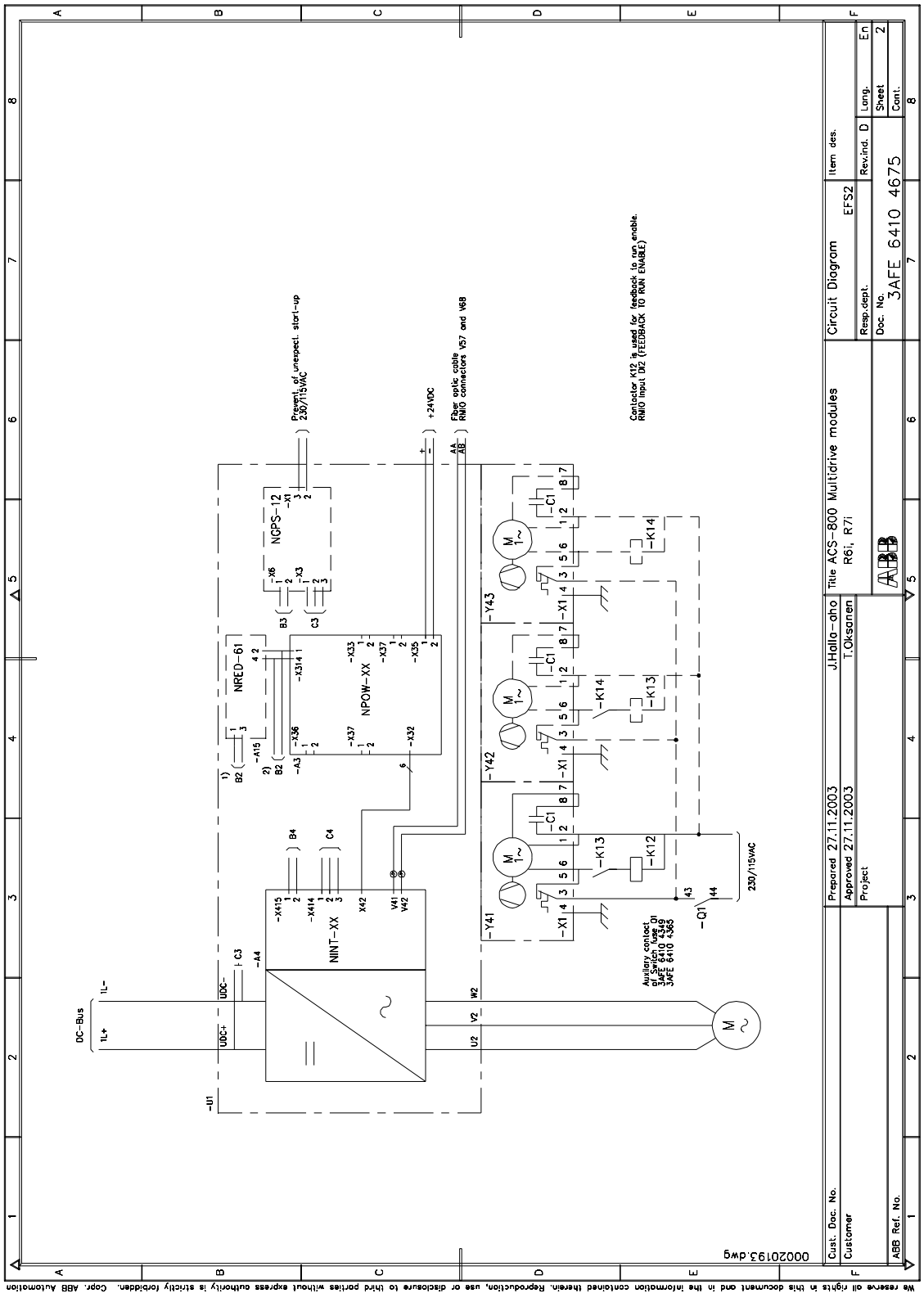


Example – Three frame R2i to R5i inverter units

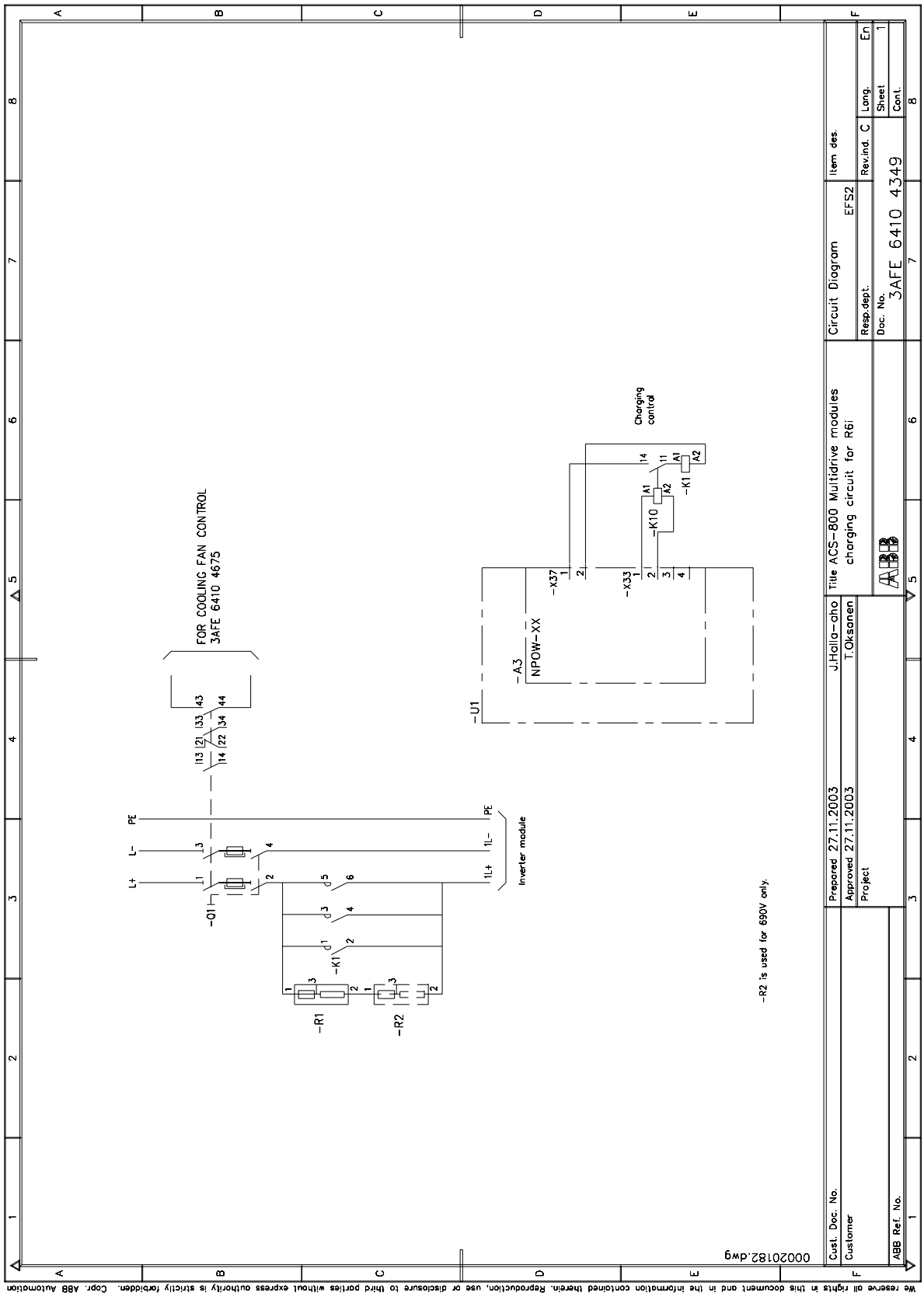


Frame R6i and R7i

Connection diagram



R6i – Charging circuit



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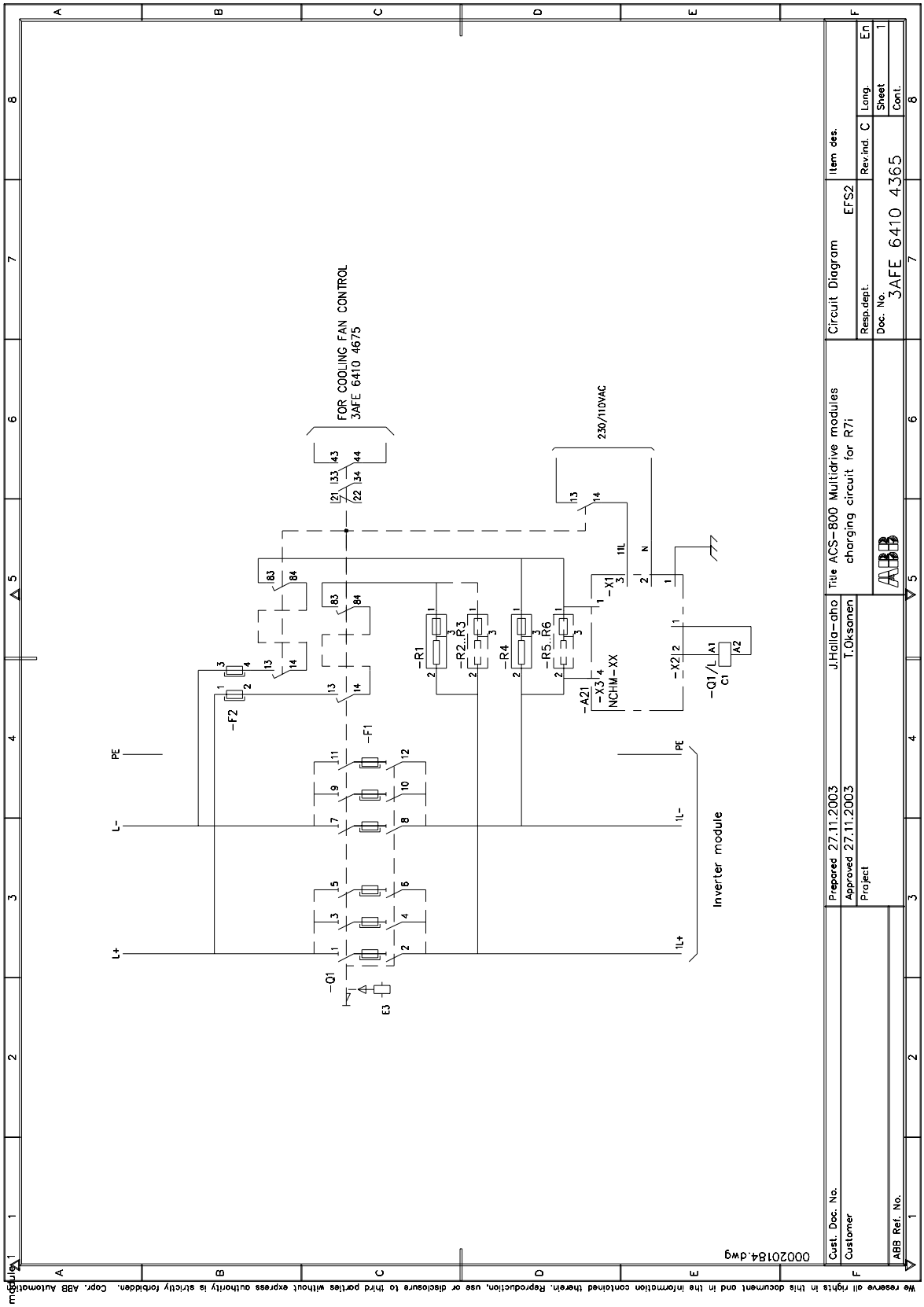
R7i – Charging circuit



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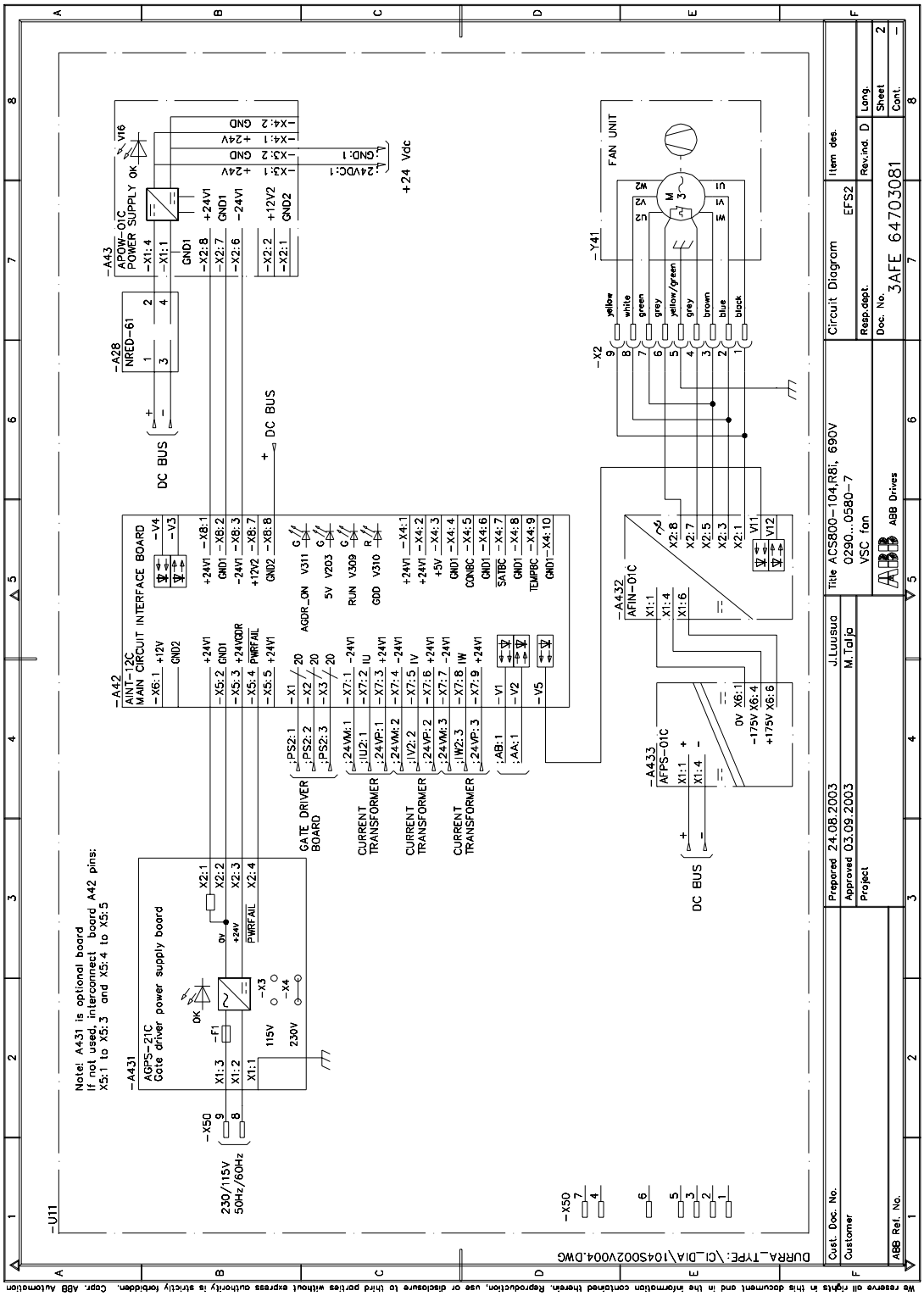
Frame R8i and multiples

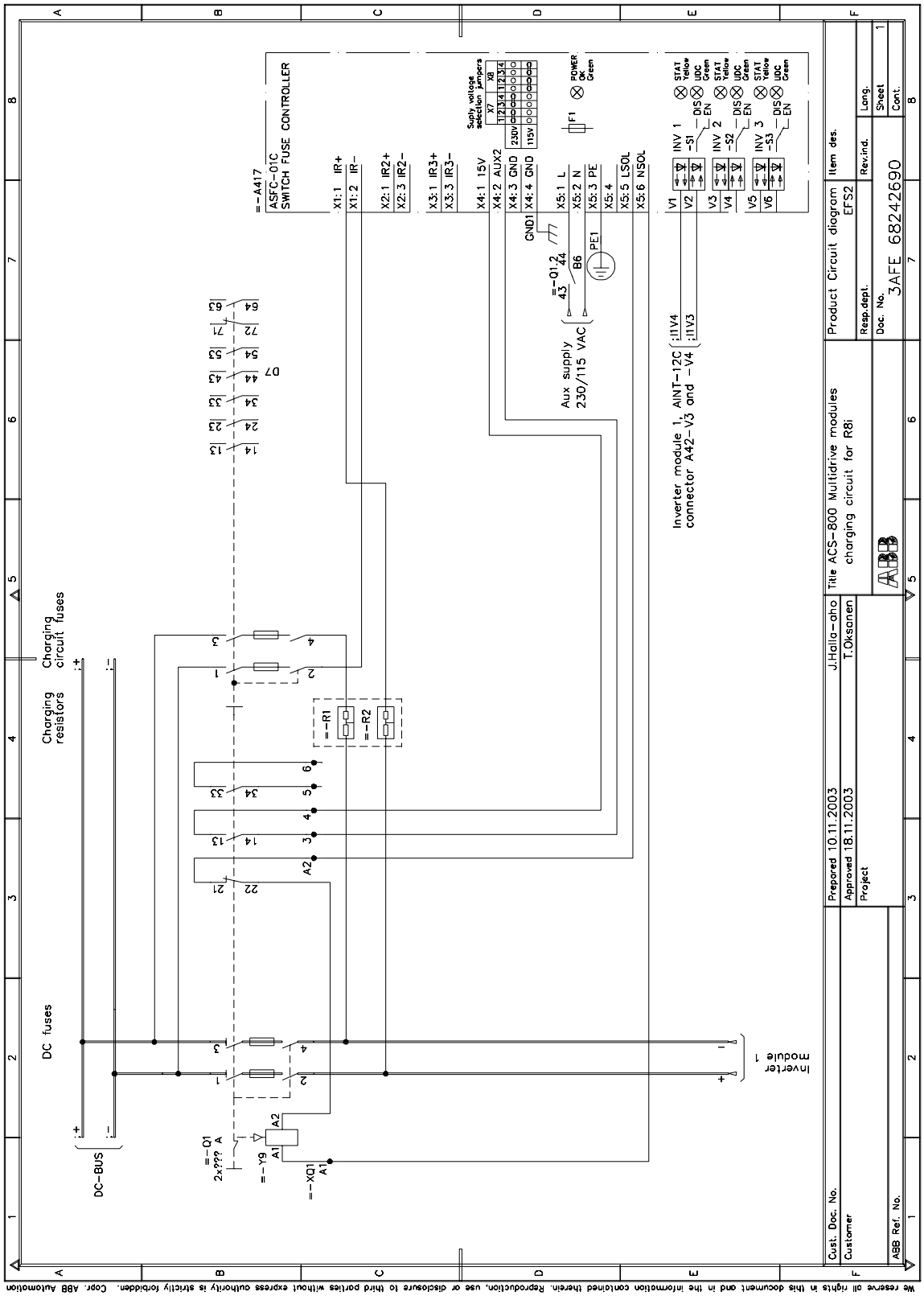
R8i – Internal diagram

The diagram depicts an R8i module with optional speed-controlled fan.

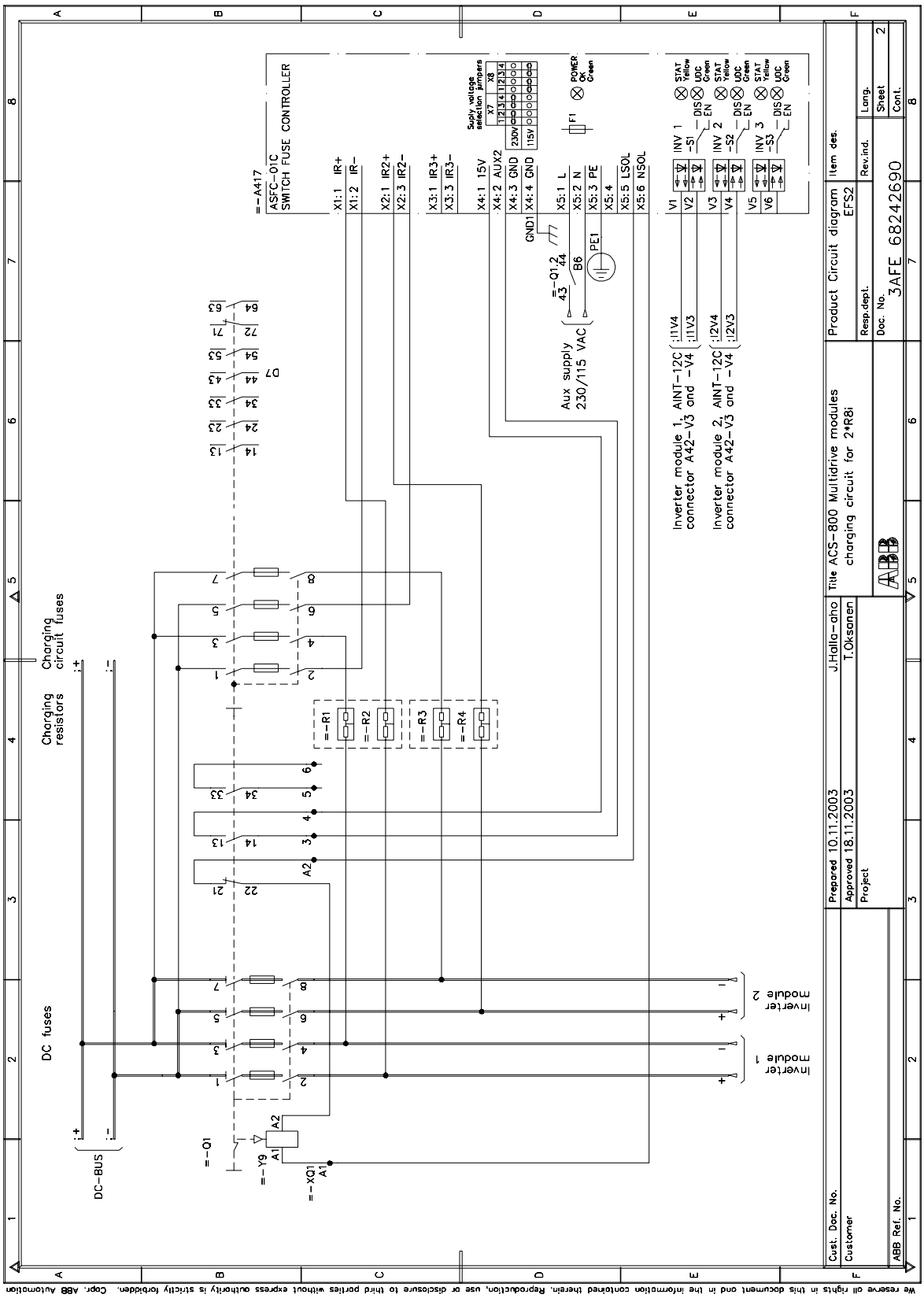


Charging circuit

R8i



2×R8i


=-A417
ASFC-01C
SWITCH FUSE CONTROLLER
Supply voltage selection jumpers
X8
X7
230V
115V
POWER
OK
Green
F1
STAT
Yellow
UDC
Green
DIS
EN
INV 1
-S1
INV 2
-S2
INV 3
-S3
X1:1 IR+
X1:2 IR-
X2:1 IR2+
X2:3 IR2-
X3:1 IR3+
X3:3 IR3-
X4:1 15V
X4:2 AUX2
X4:3 GND
X4:4 GND
X5:1 L
X5:2 N
X5:3 PE
X5:4
X5:5 LSOL
X5:6 NSOL
V1
V2
V3
V4
V5
V6
GND1
=-Q1.2
43
44
B6
PE1
Aux supply
230/115 VAC
Inverter module 1, AINT-12C
connector A42-V3 and -V4
:11V4
:11V3
Inverter module 2, AINT-12C
connector A42-V3 and -V4
:12V4
:12V3
Charging
circuit fuses
Charging
resistors
DC fuses
=-R1
=-R2
=-R3
=-R4
=-Q1
=-Y9
=-XQ1
A1
A2
DC-BUS
Inverter
module 1
Inverter
module 2
Prepared 10.11.2003
J.Halla-aho
Approved 18.11.2003
T.Oksanen
Project
Title ACS-800 Multidrive modules
charging circuit for 2*R8i
Product Circuit diagram
EFS2
Item des.
Resp.dept.
Rev.ind.
Lang.
Doc. No.
3AFE 68242690
Sheet
2
Cont.
Cust. Doc. No.
Customer
ABB Ref. No.
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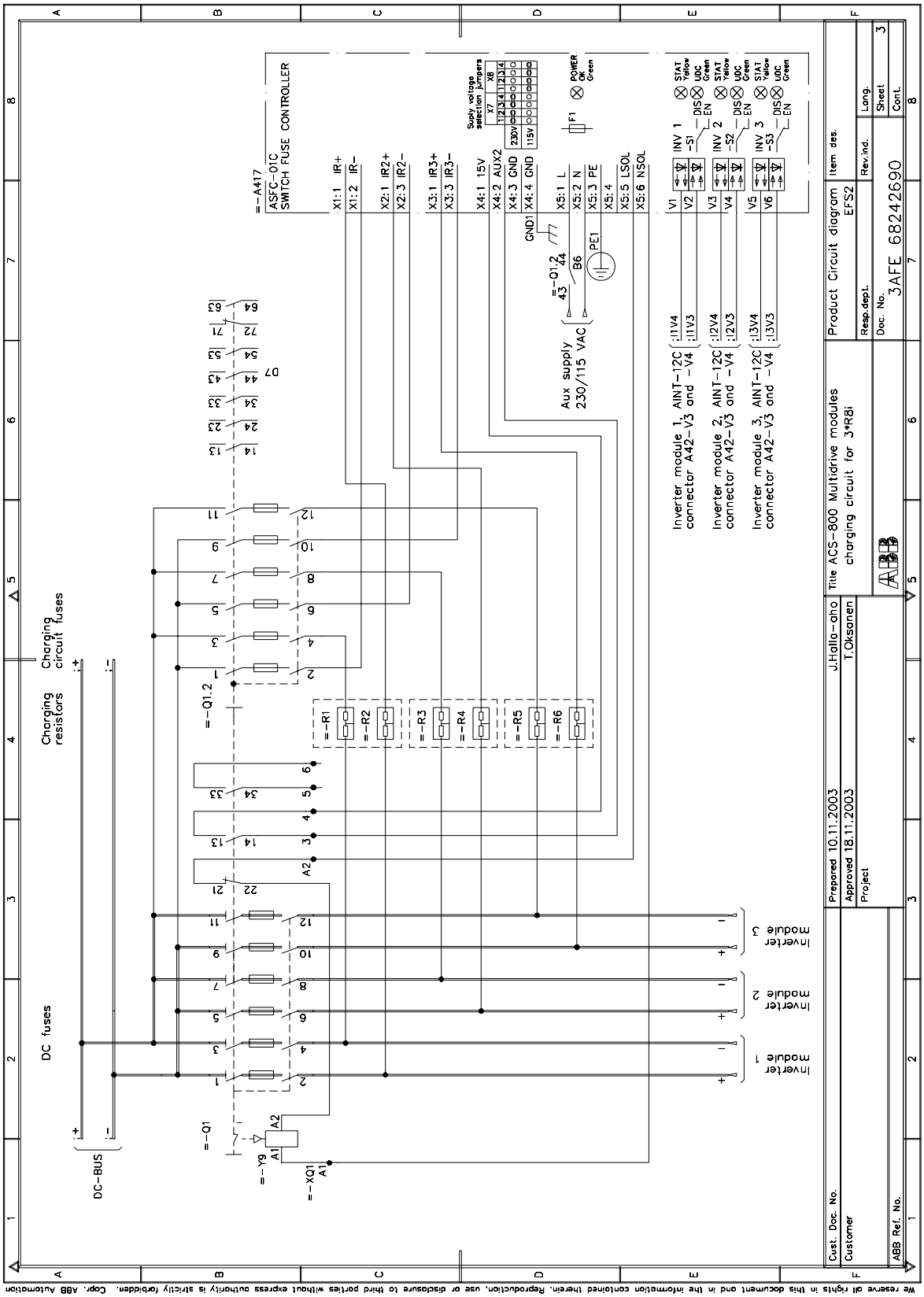
3×R8i


=-A417
ASFC-01C
SWITCH FUSE CONTROLLER
Supply voltage selection jumpers
X7
X8
230V
115V
POWER OK Green
INV 1 -S1
INV 2 -S2
INV 3 -S3
STAT Yellow
UDC Green
DIS EN
Inverter module 1, AINT-12C connector A42-V3 and -V4
Inverter module 2, AINT-12C connector A42-V3 and -V4
Inverter module 3, AINT-12C connector A42-V3 and -V4
Aux supply 230/115 VAC
=-Q1.2
=-R1
=-R2
=-R3
=-R4
=-R5
=-R6
=-Q1
=-Y9
=-XQ1
DC fuses
Charging resistors
Charging circuit fuses
DC-BUS
Inverter module 1
Inverter module 2
Inverter module 3
Product Circuit diagram
EFS2
Item des.
Resp.dept.
Rev.ind.
Lang.
Doc. No.
3AFE 68242690
Sheet
3
Cont.
Title ACS-800 Multidrive modules charging circuit for 3*R8i
Prepared 10.11.2003
J.Hallo-aho
Approved 18.11.2003
T.Oksanen
Project
Cust. Doc. No.
Customer
ABB Ref. No.
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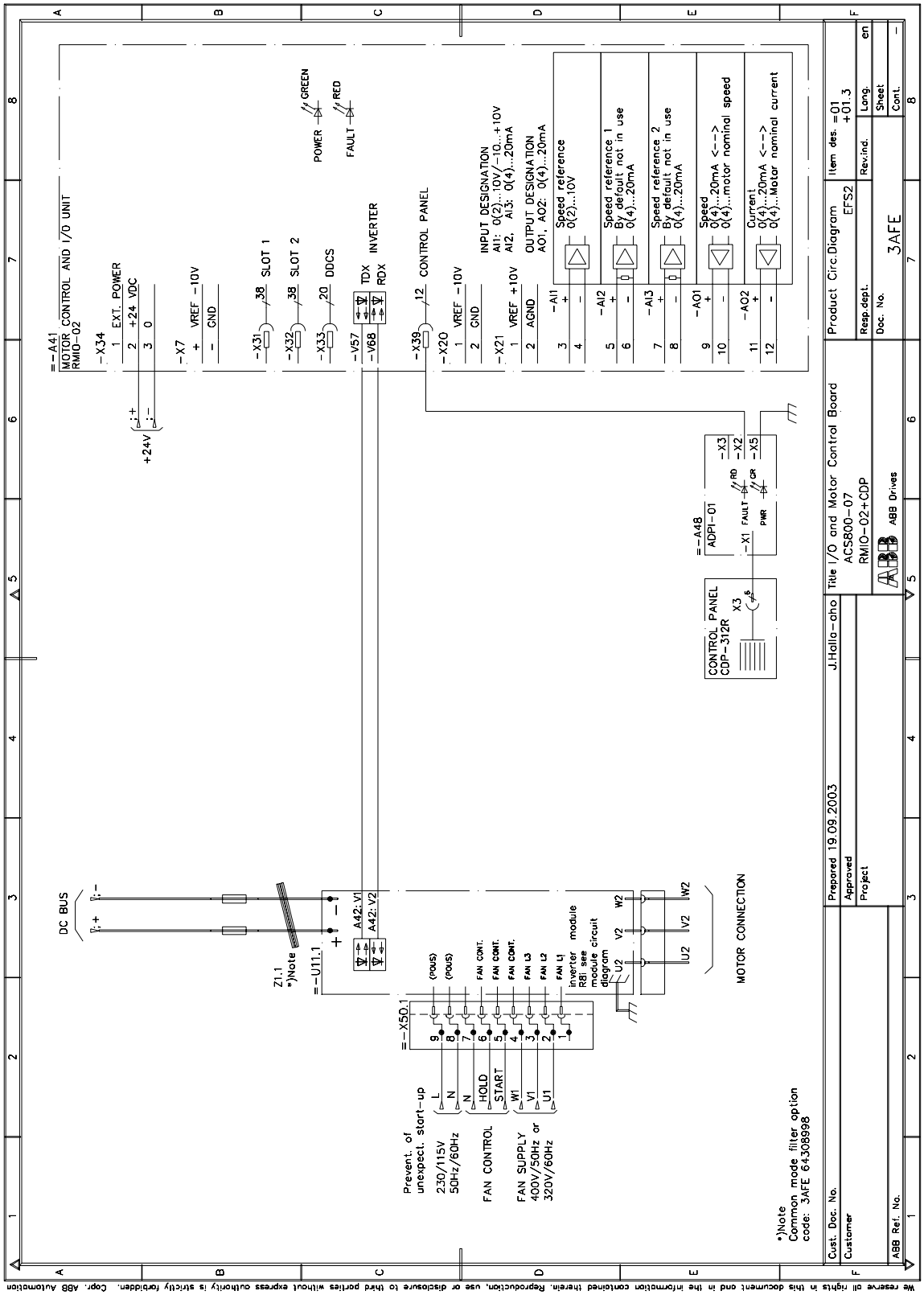
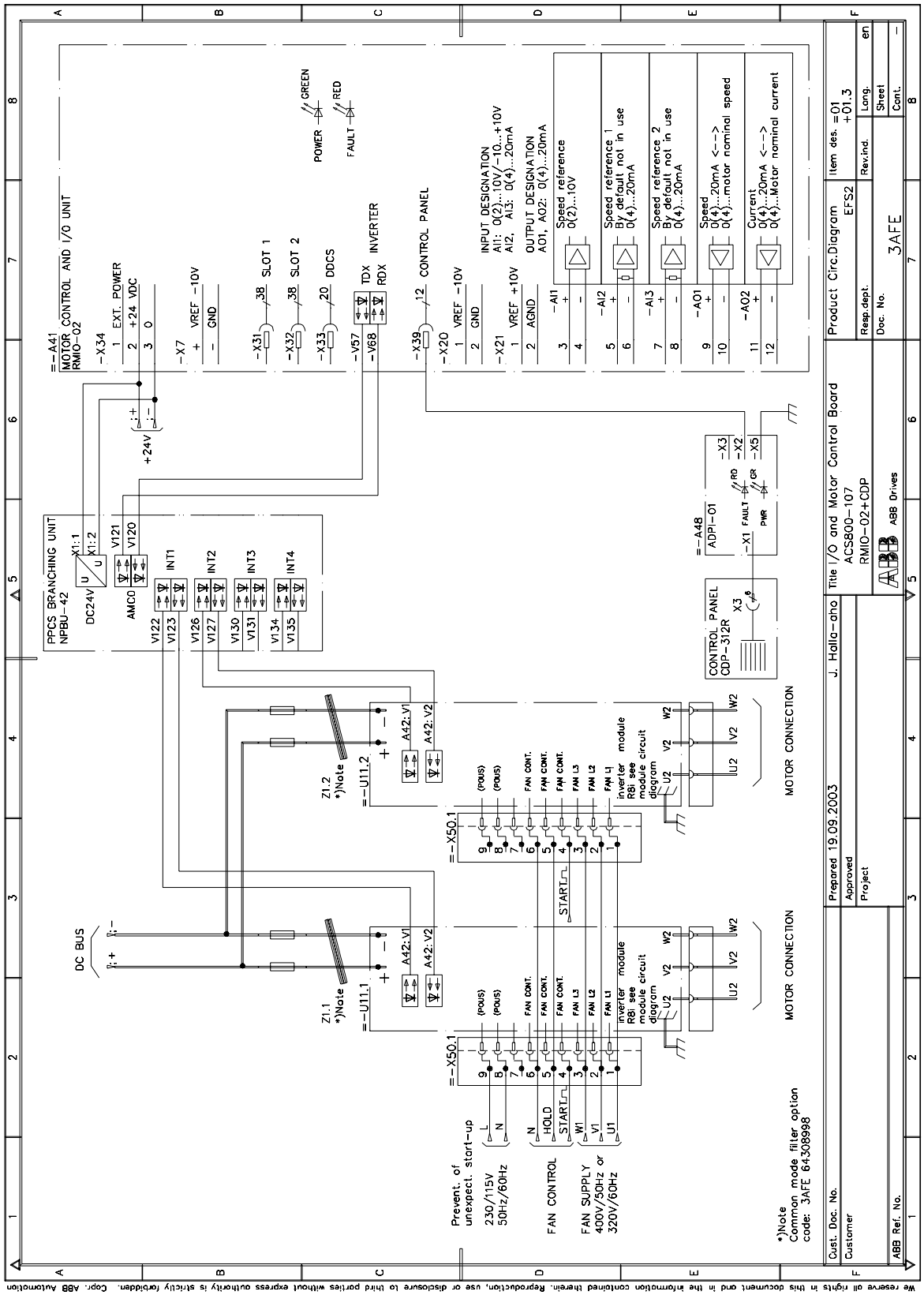
I/O and control

R8i



2×R8i


=-A41
MOTOR CONTROL AND I/O UNIT
RMIO-02
-X34
1 EXT. POWER
2 +24 VDC
3 0
-X7
+ VREF -10V
- GND
-X31 38 SLOT 1
-X32 38 SLOT 2
-X33 20 DDCS
-V67 TDX
-V68 RDX
INVERTER
POWER GREEN
FAULT RED
-X39 12 CONTROL PANEL
-X20
1 VREF -10V
2 GND
-X21
1 VREF +10V
2 AGND
INPUT DESIGNATION
AI1: 0(2)...10V/-10...+10V
AI2, AI3: 0(4)...20mA
OUTPUT DESIGNATION
AO1, AO2: 0(4)...20mA
-AI1 Speed reference 0(2)...10V
-AI2 Speed reference 1 By default not in use 0(4)...20mA
-AI3 Speed reference 2 By default not in use 0(4)...20mA
-AO1 Speed 0(4)...20mA <--> 0(4)...motor nominal speed
-AO2 Current 0(4)...20mA <--> 0(4)...Motor nominal current
+24V
PPCS BRANCHING UNIT
NPBU-42
DC24V
AMC0
V121 V120
INT1 INT2 INT3 INT4
V122 V123 V126 V127 V130 V131 V134 V135
=-A48
ADPI-01
-X3 -X2 -X5
-X1 FAULT PWR
CONTROL PANEL
CDP-312R
X3
DC BUS
=-U11.1
=-U11.2
A42:V1 A42:V2
Z1.1 *)Note
Z1.2 *)Note
=-X50.1
(POUS) (POUS) FAN CONT. FAN CONT. FAN L3 FAN L2 FAN L1
inverter module R8i see module circuit diagram
U2 V2 W2
MOTOR CONNECTION
Prevent. of unexpect. start-up
230/115V 50Hz/60Hz
L N
FAN CONTROL
N HOLD START
FAN SUPPLY 400V/50Hz or 320V/60Hz
W1 V1 U1
*)Note
Common mode filter option code: 3AFE 64308998
Cust. Doc. No.
Customer
ABB Ref. No.
Prepared 19.09.2003 J. Halla-aho
Approved
Project
Title I/O and Motor Control Board ACS800-107 RMIO-02+CDP
Product Circ.Diagram EFS2
Item des. =01 +01.3
Resp.dept.
Doc. No. 3AFE
Rev.ind.
Lang. en
Sheet
Cont. -
ABB Drives
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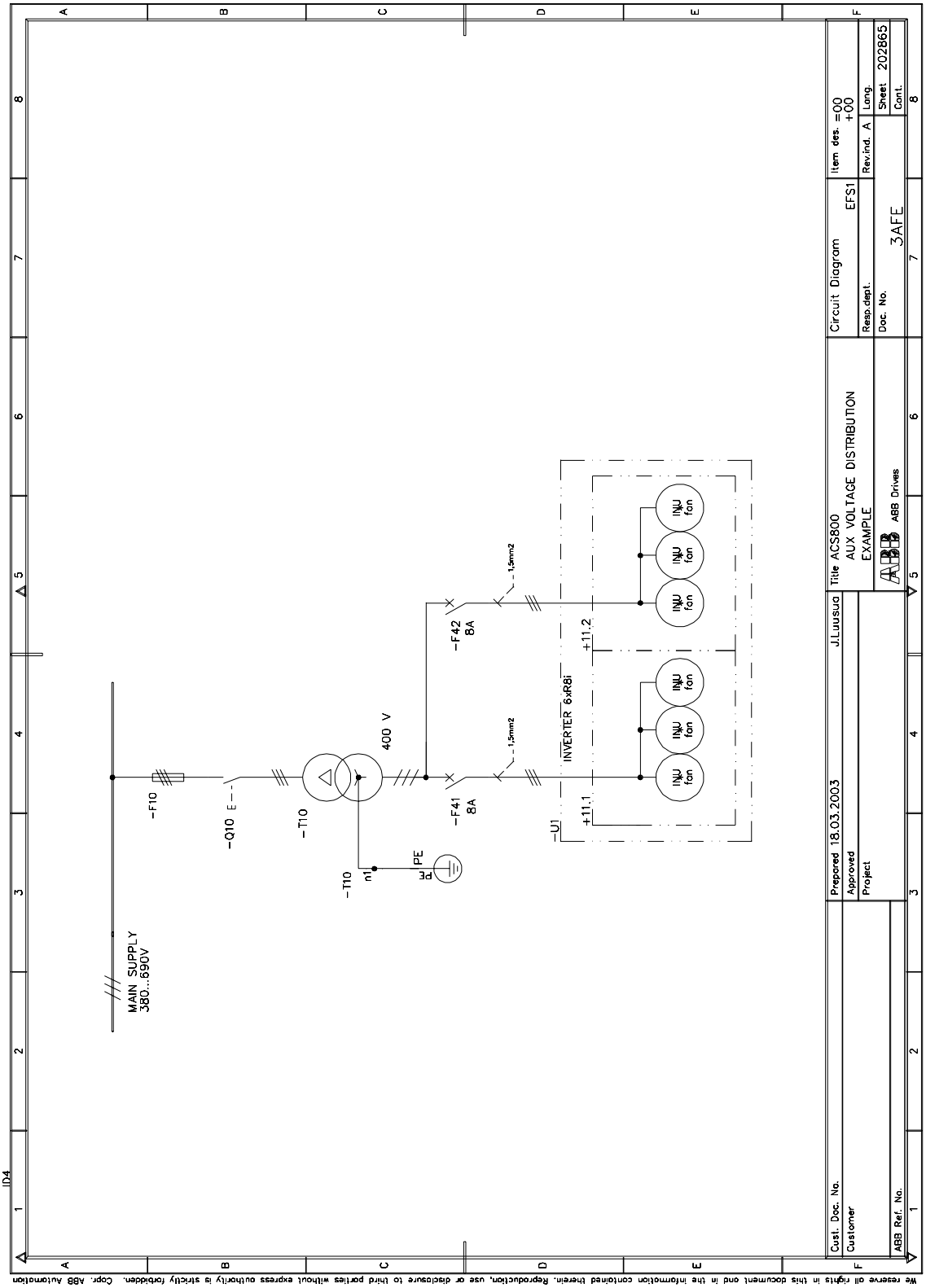
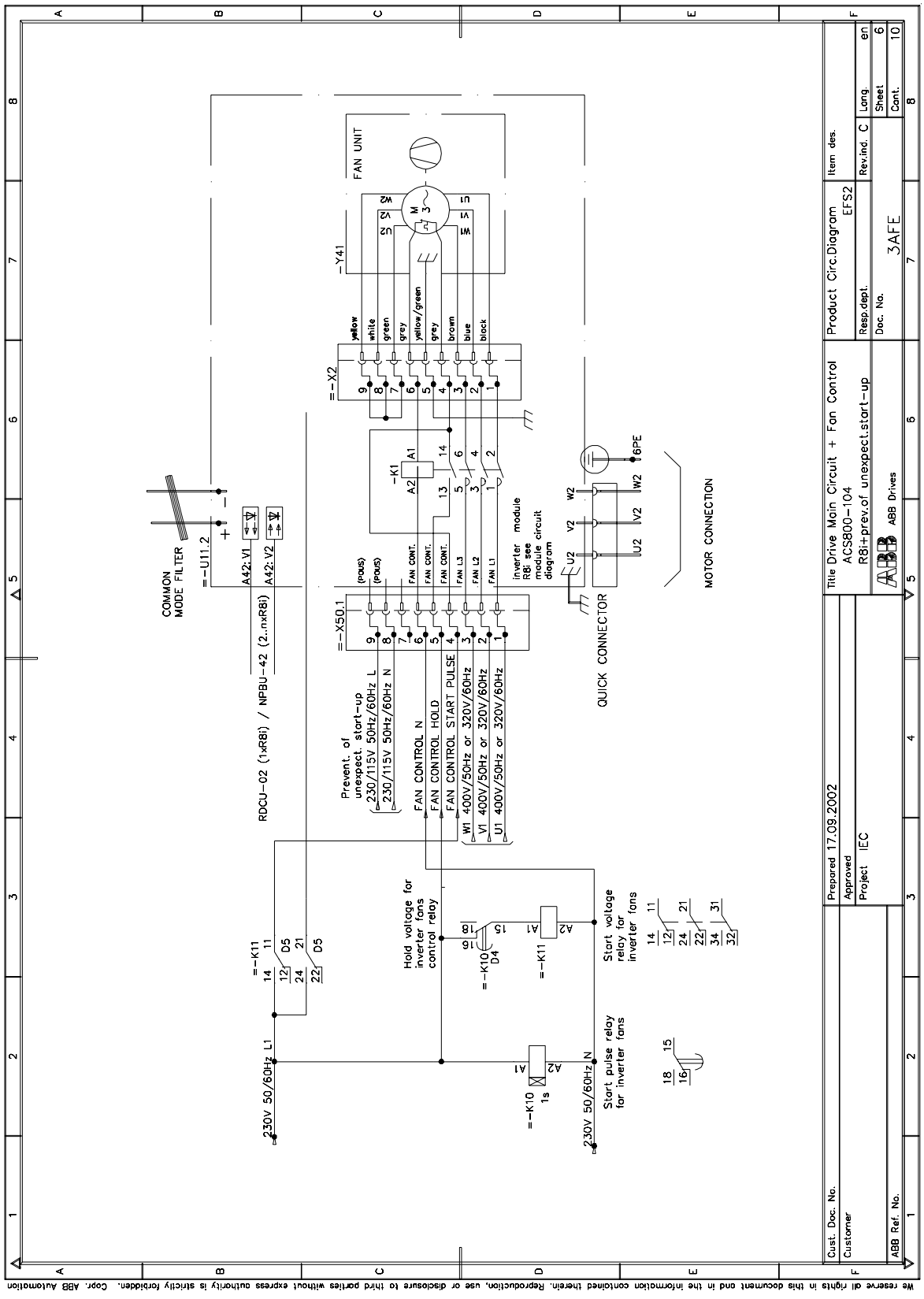
Cooling fan control (inverter modules without optional speed-controlled fan)

Auxiliary voltage distribution



R8i


FAN UNIT
-Y41
-X2
yellow
white
green
grey
yellow/green
grey
brown
blue
black
-K1
inverter module
R8i see module circuit diagram
-X50.1
(Pous)
(Pous)
FAN CONT.
FAN CONT.
FAN CONT.
FAN L3
FAN L2
FAN L1
COMMON MODE FILTER
-U11.2
A42:V1
A42:V2
RDCU-02 (1xR8i) / NPBU-42 (2..nxR8i)
Prevent. of unexpect. start-up
230/115V 50Hz/60Hz L
230/115V 50Hz/60Hz N
FAN CONTROL N
FAN CONTROL HOLD
FAN CONTROL START PULSE
W1 400V/50Hz or 320V/60Hz
V1 400V/50Hz or 320V/60Hz
U1 400V/50Hz or 320V/60Hz
QUICK CONNECTOR
MOTOR CONNECTION
6PE
W2
V2
U2
=-K11
D5
=-K10
D4
=-K10
1s
Hold voltage for inverter fans control relay
Start voltage relay for inverter fans
Start pulse relay for inverter fans
230V 50/60Hz L1
230V 50/60Hz N
Title Drive Main Circuit + Fan Control
ACS800-104
R8i+prev.of unexpect.start-up
Product Circ.Diagram
EFS2
Item des.
Rev.ind. C
Lang en
Sheet 6
Cont. 10
Resp.dept.
Doc. No. 3AFE
ABB Drives
Prepared 17.09.2002
Approved
Project IEC
Cust. Doc. No.
Customer
ABB Ref. No.
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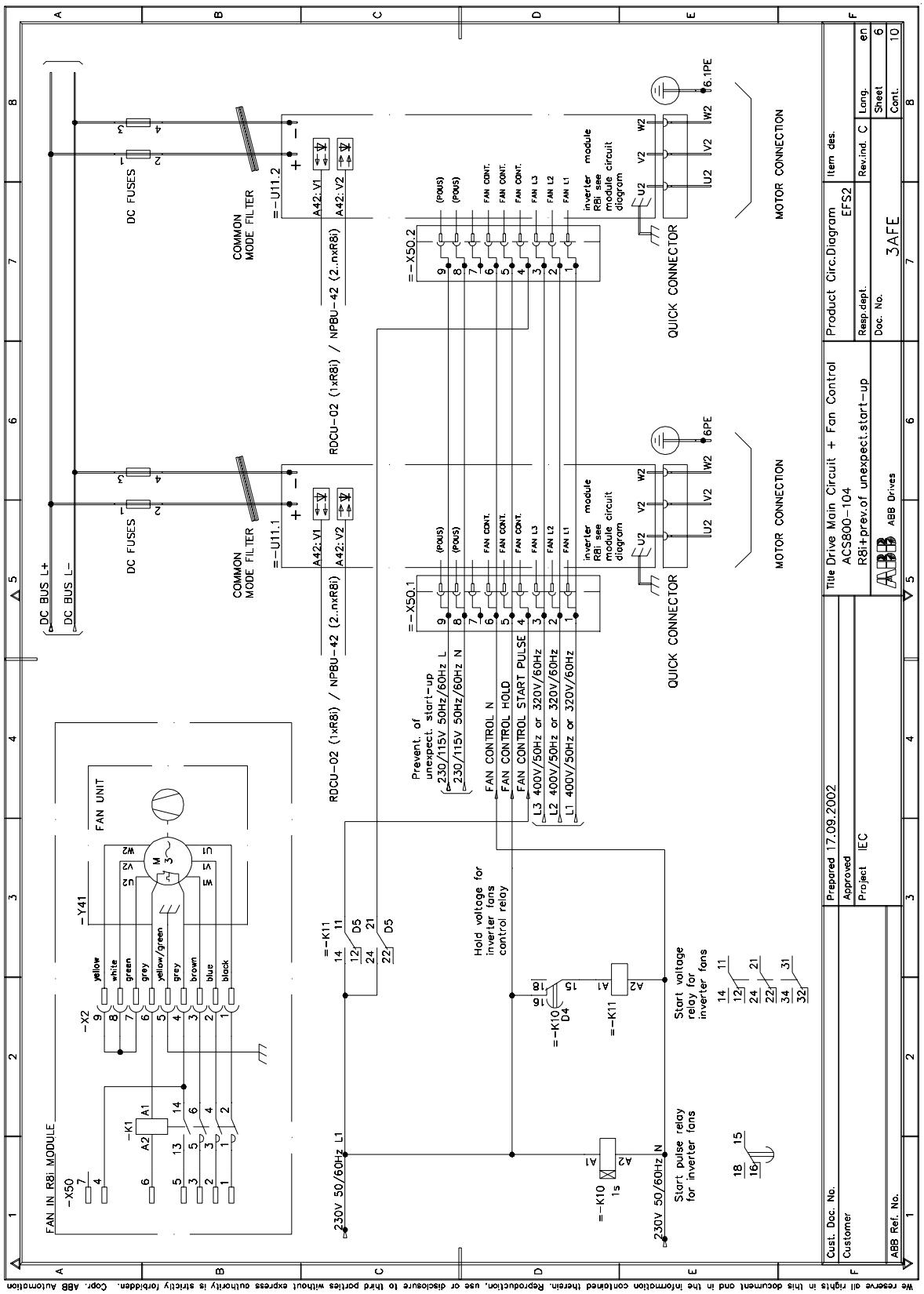
2×R8i



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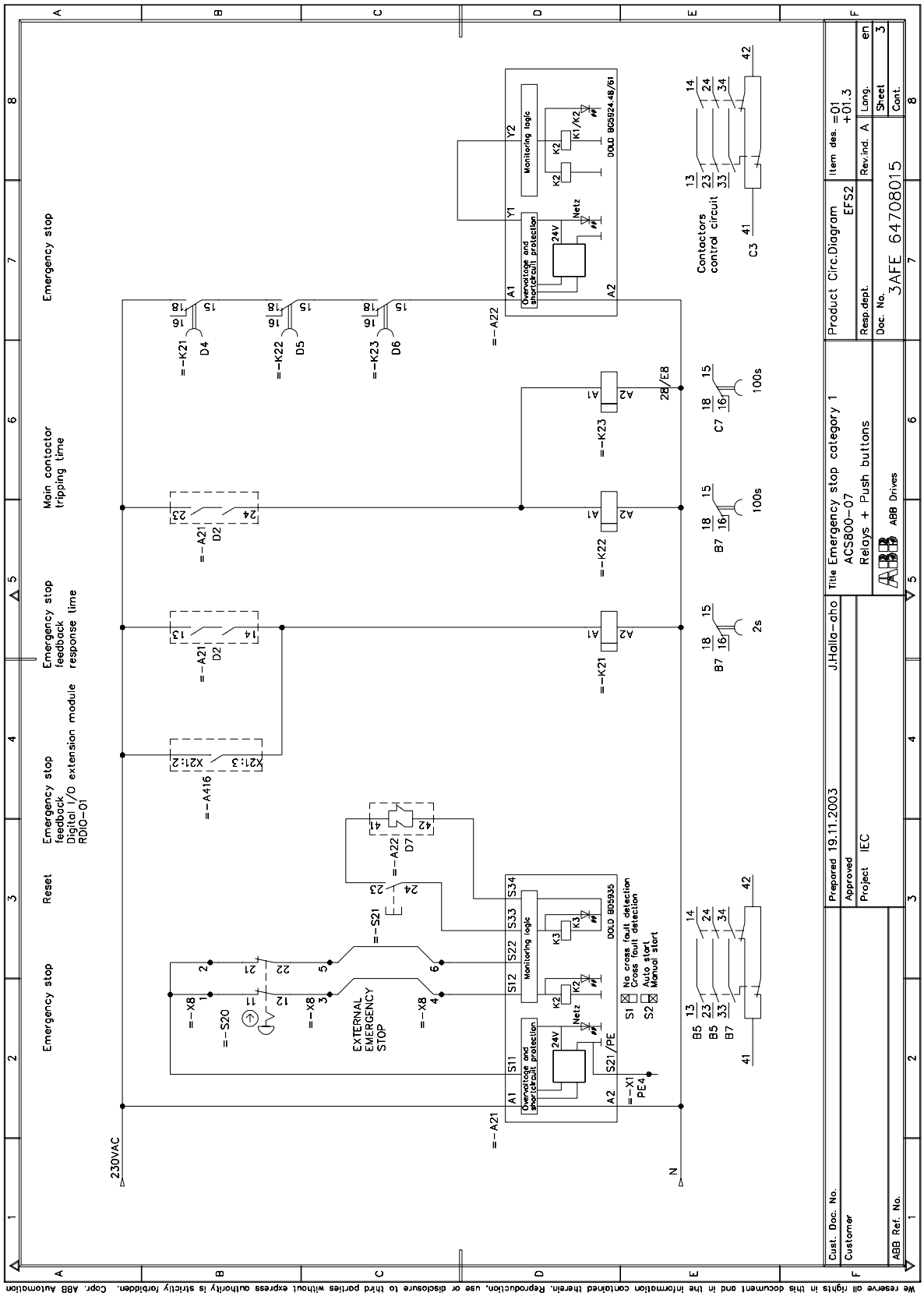
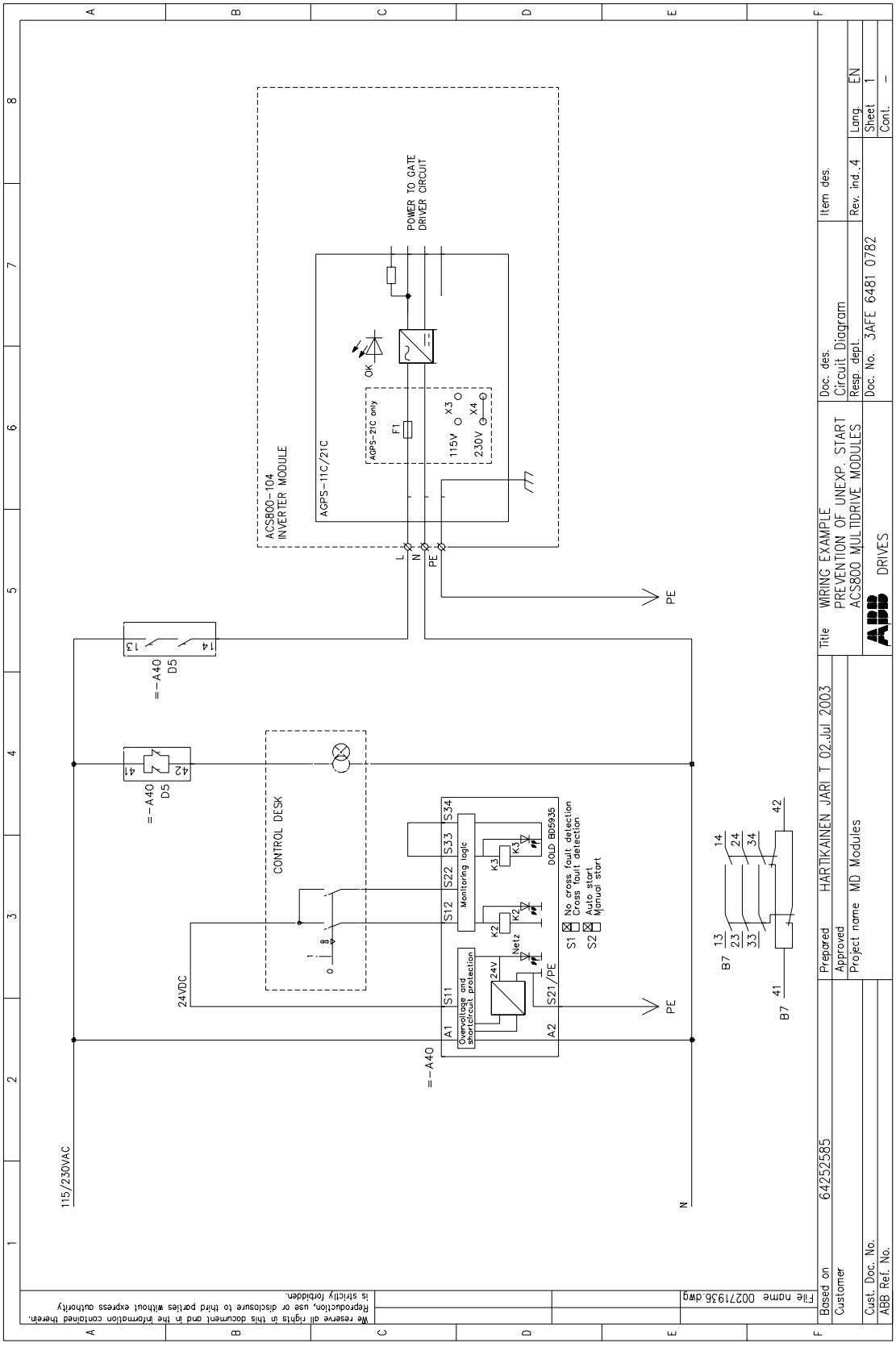
Example – Emergency stop (Category 1)



Example – Prevention of unexpected start



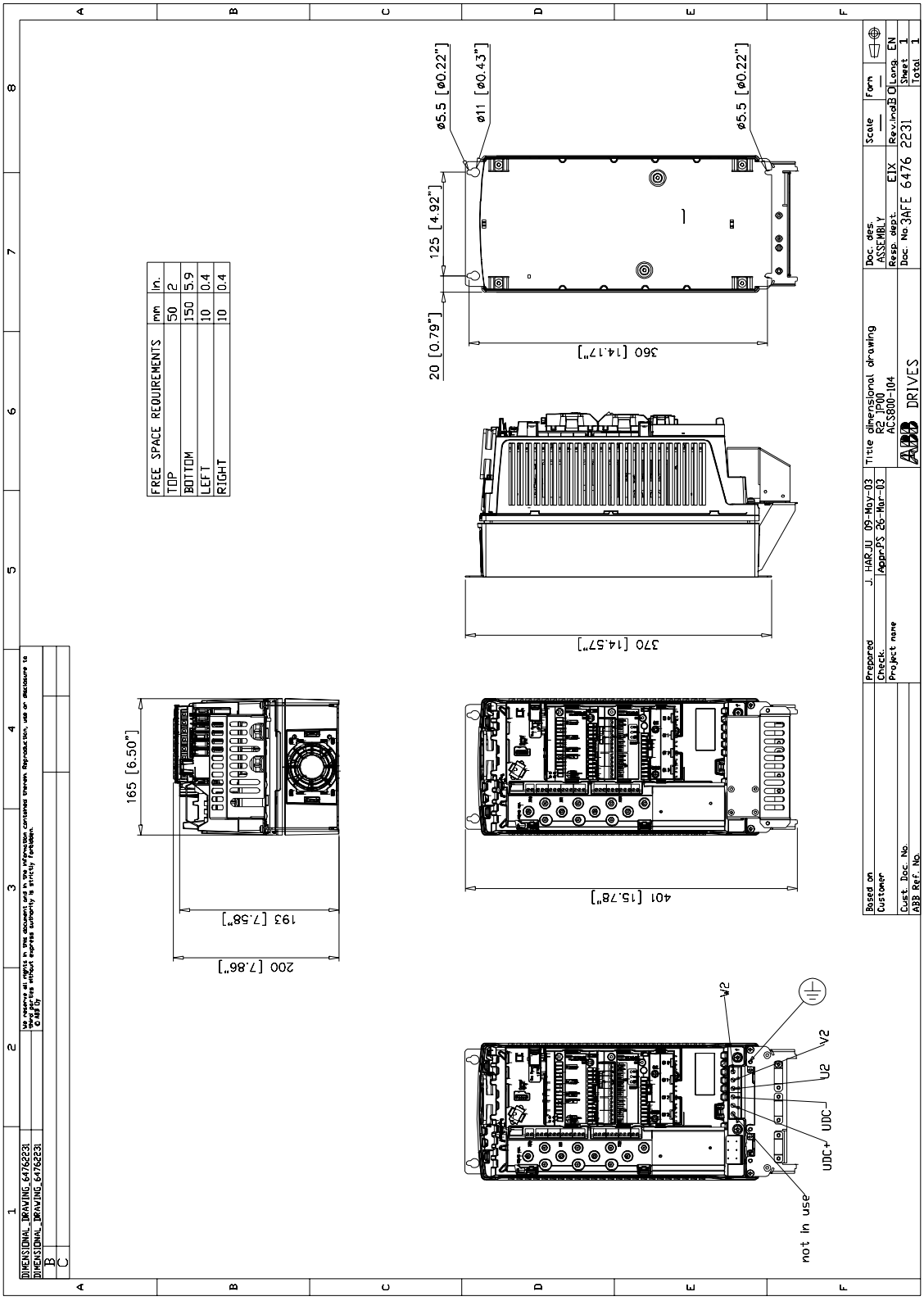
Dimensional drawings

What this chapter contains

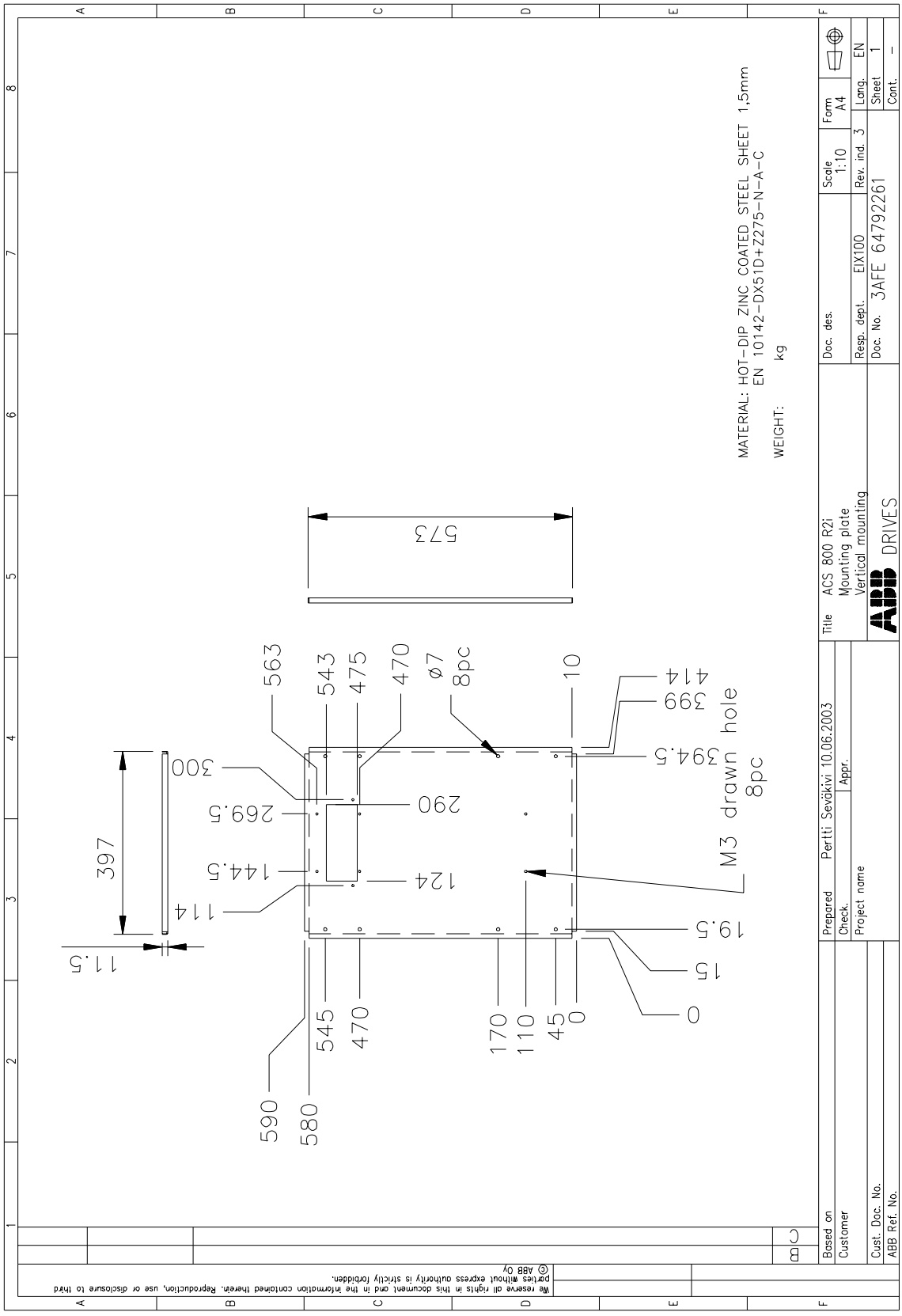
This chapter contains dimensional drawings of the ACS800-104 inverter modules as well as auxiliary components and mounting accessories.

Frame R2i

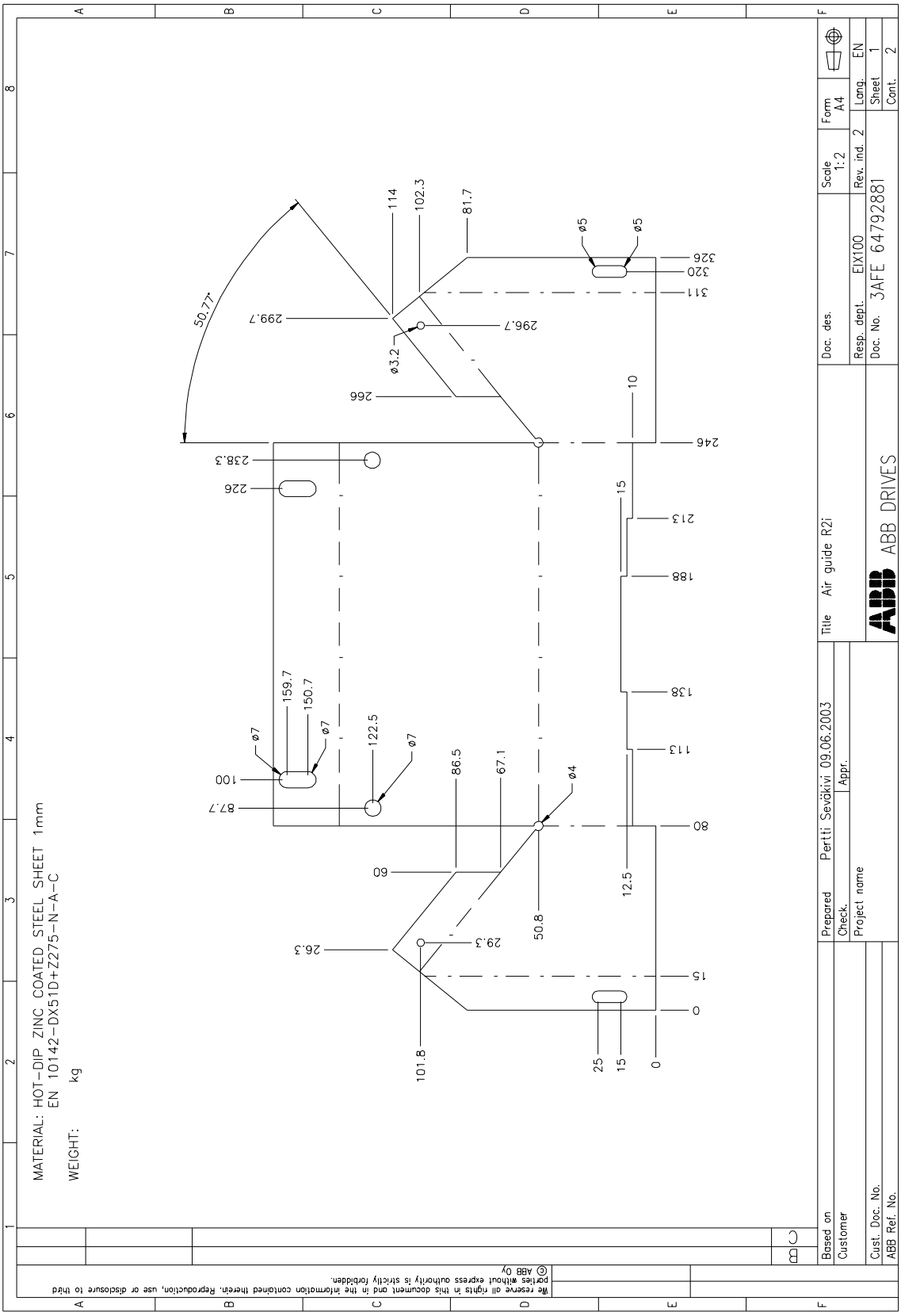
Module dimensions

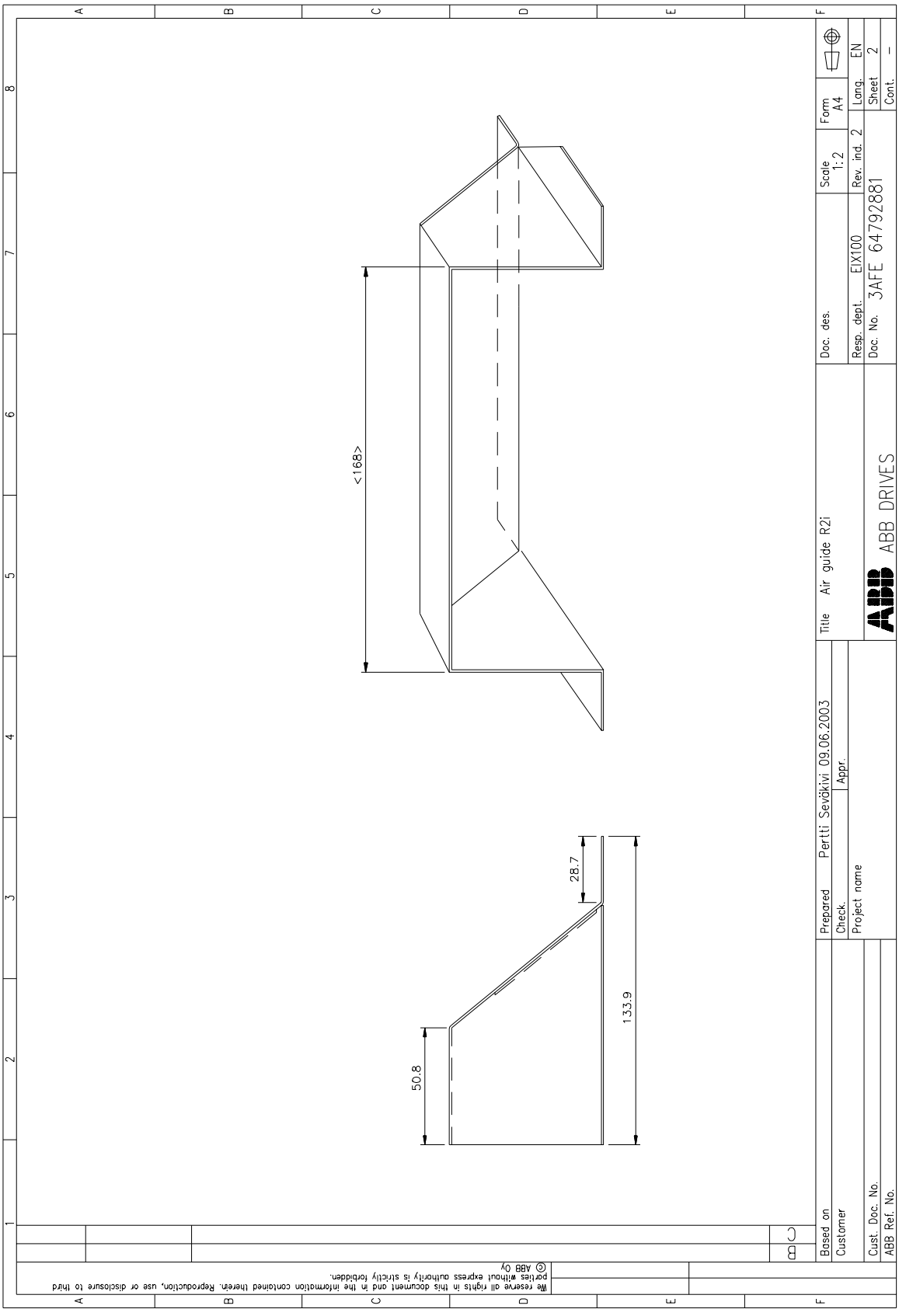


Mounting plate (vertical)



Airflow guide for vertical mounting




<168>
28.7
133.9
50.8
Title Air guide R2i
Doc. des.
Scale 1:2
Form A4
Resp. dept. EIX100
Rev. ind. 2
Lang. EN
Doc. No. 3AFE 64792881
Sheet 2
Cont. –
ABB DRIVES
Prepared Pertti Seväkivi 09.06.2003
Check.
Appr.
Project name
Based on
Customer
Cust. Doc. No.
ABB Ref. No.
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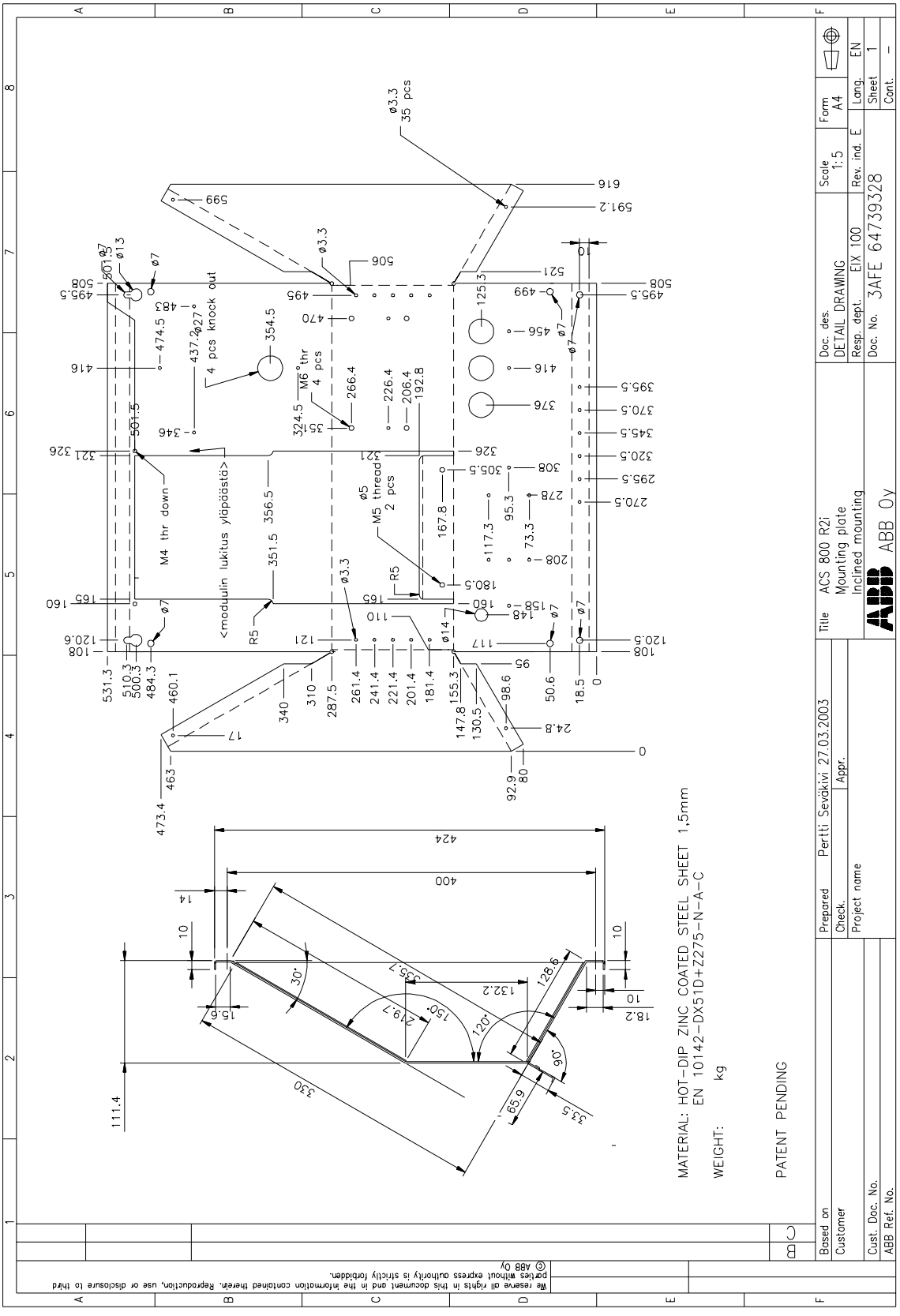
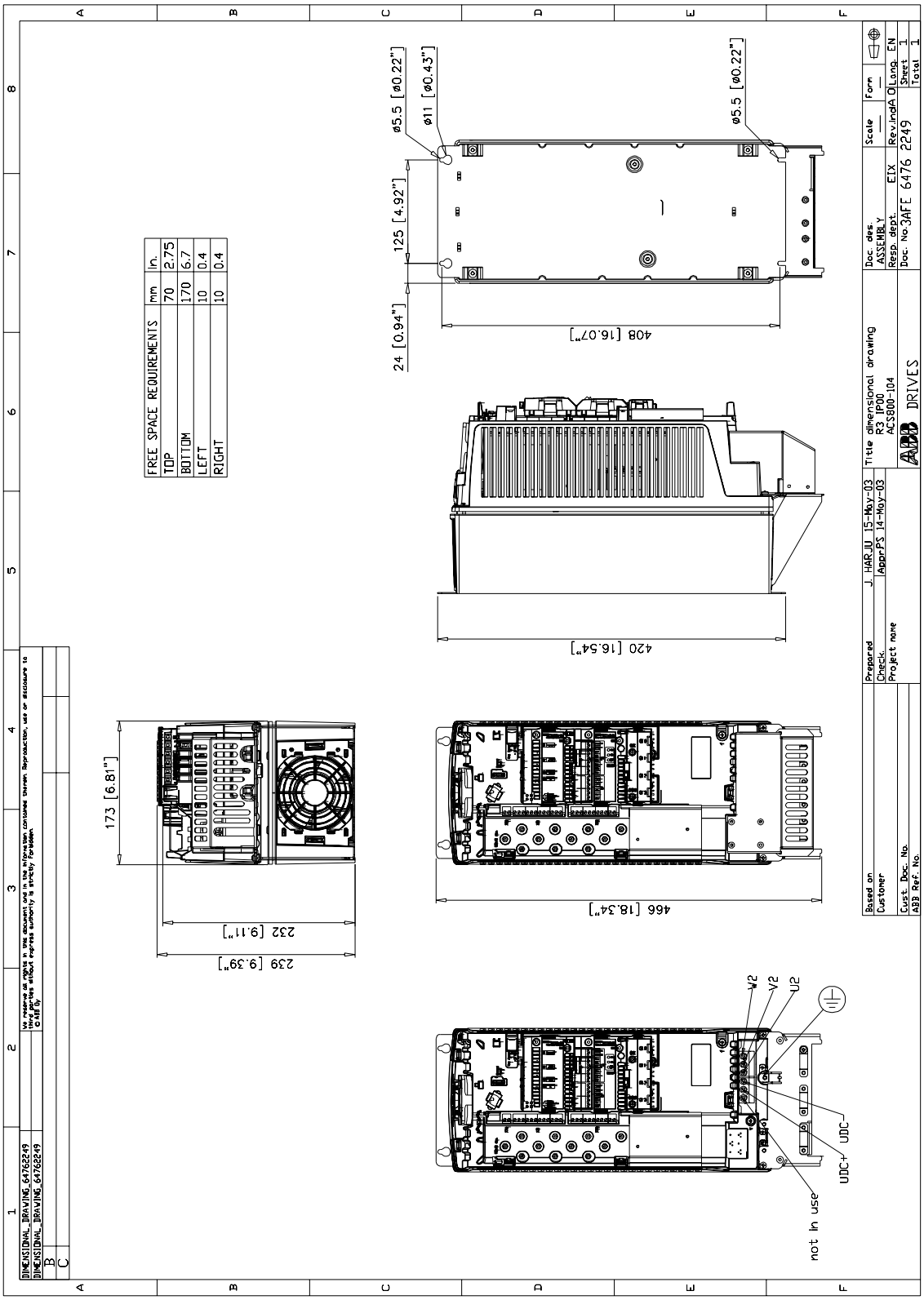
Mounting plate (inclined)

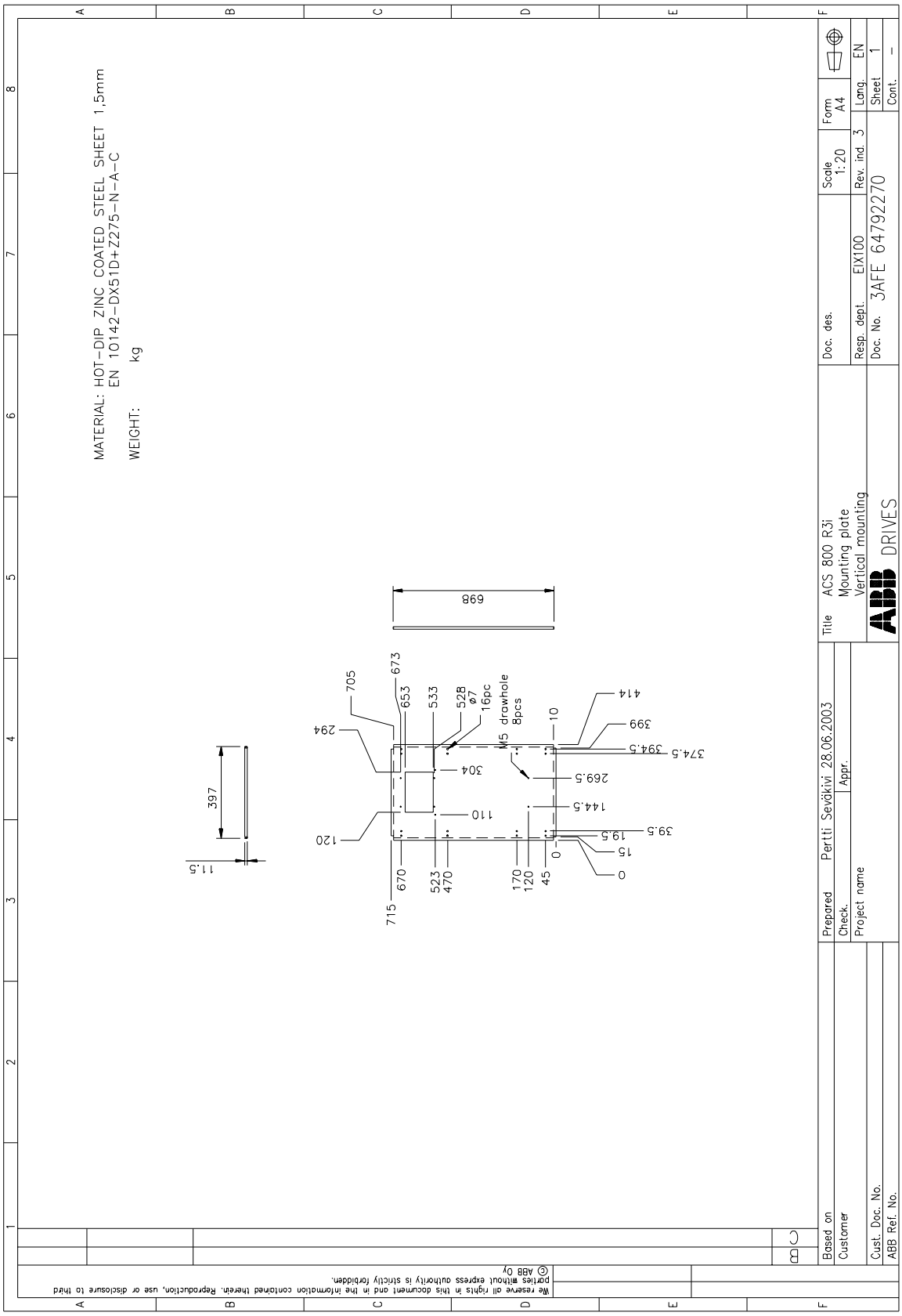


Frame R3i

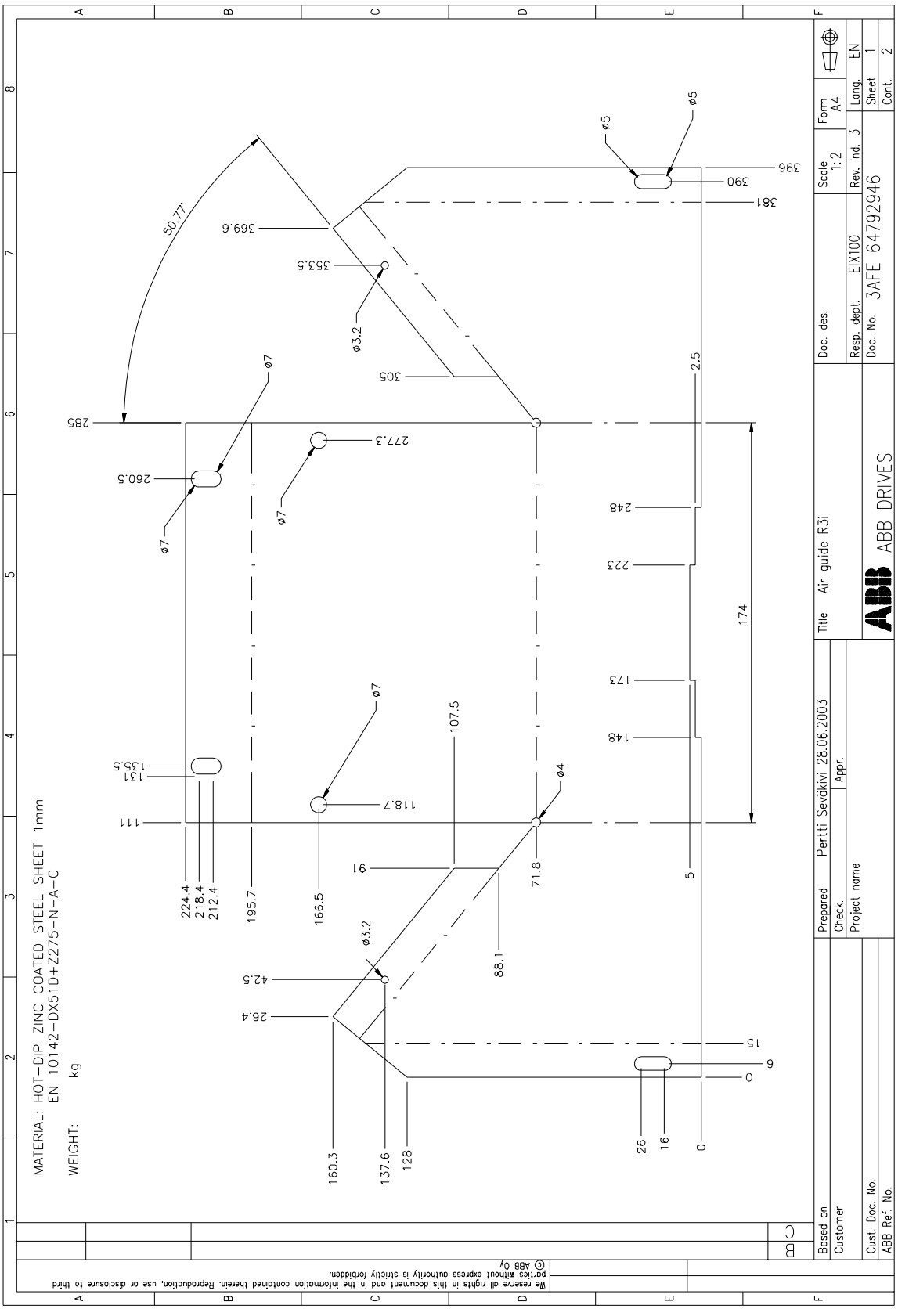
Module dimensions

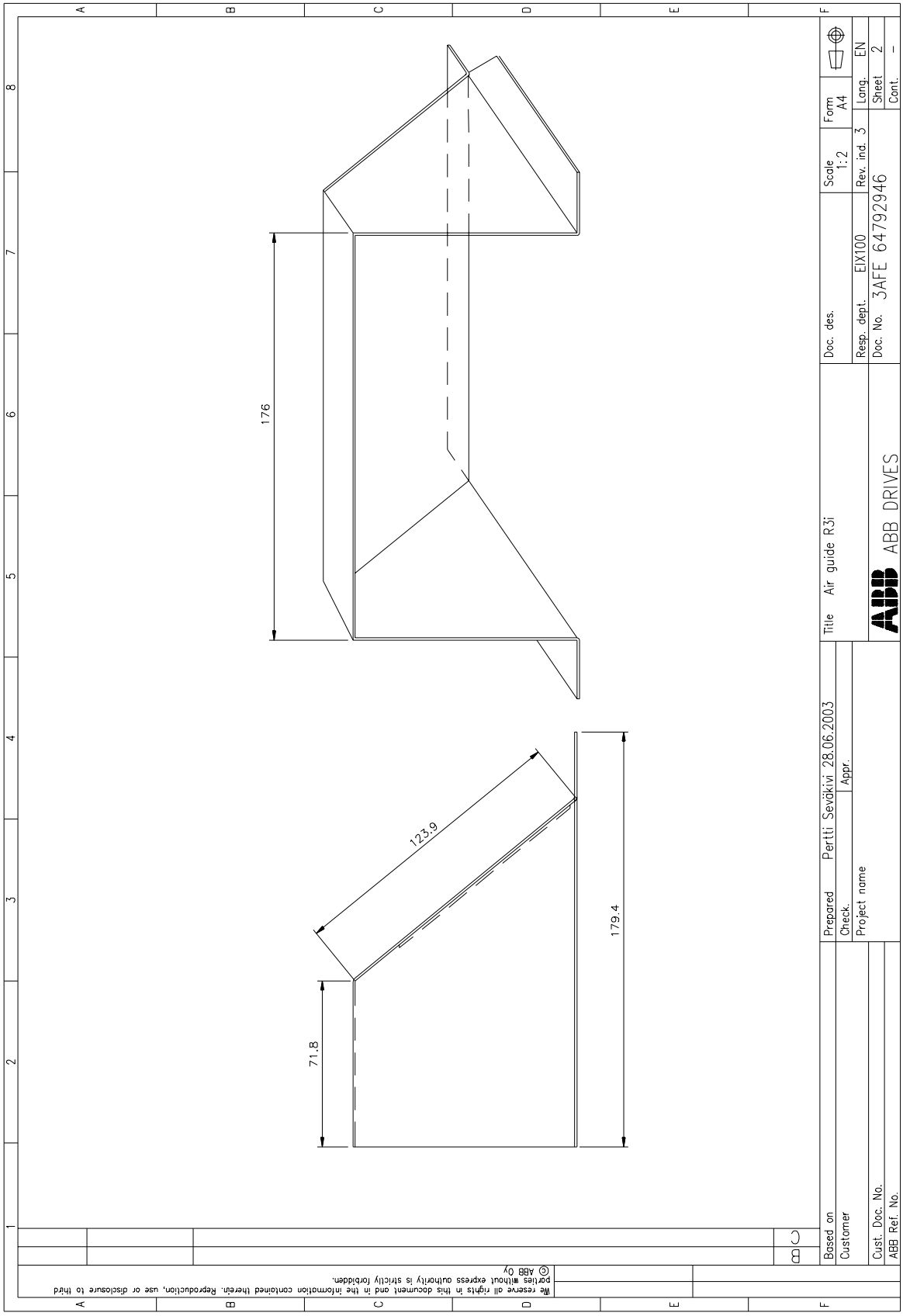


Mounting plate (vertical)



Airflow guide for vertical mounting




176
123.9
179.4
71.8
Prepared Pertti Seväkivi 28.06.2003
Check.
Appr.
Project name
Based on
Customer
Cust. Doc. No.
ABB Ref. No.
Title Air guide R3i
Doc. des.
Resp. dept. EIX100
Doc. No. 3AFE 64792946
Scale 1:2
Rev. ind. 3
Form A4
Lang. EN
Sheet 2
Cont. –
ABB DRIVES
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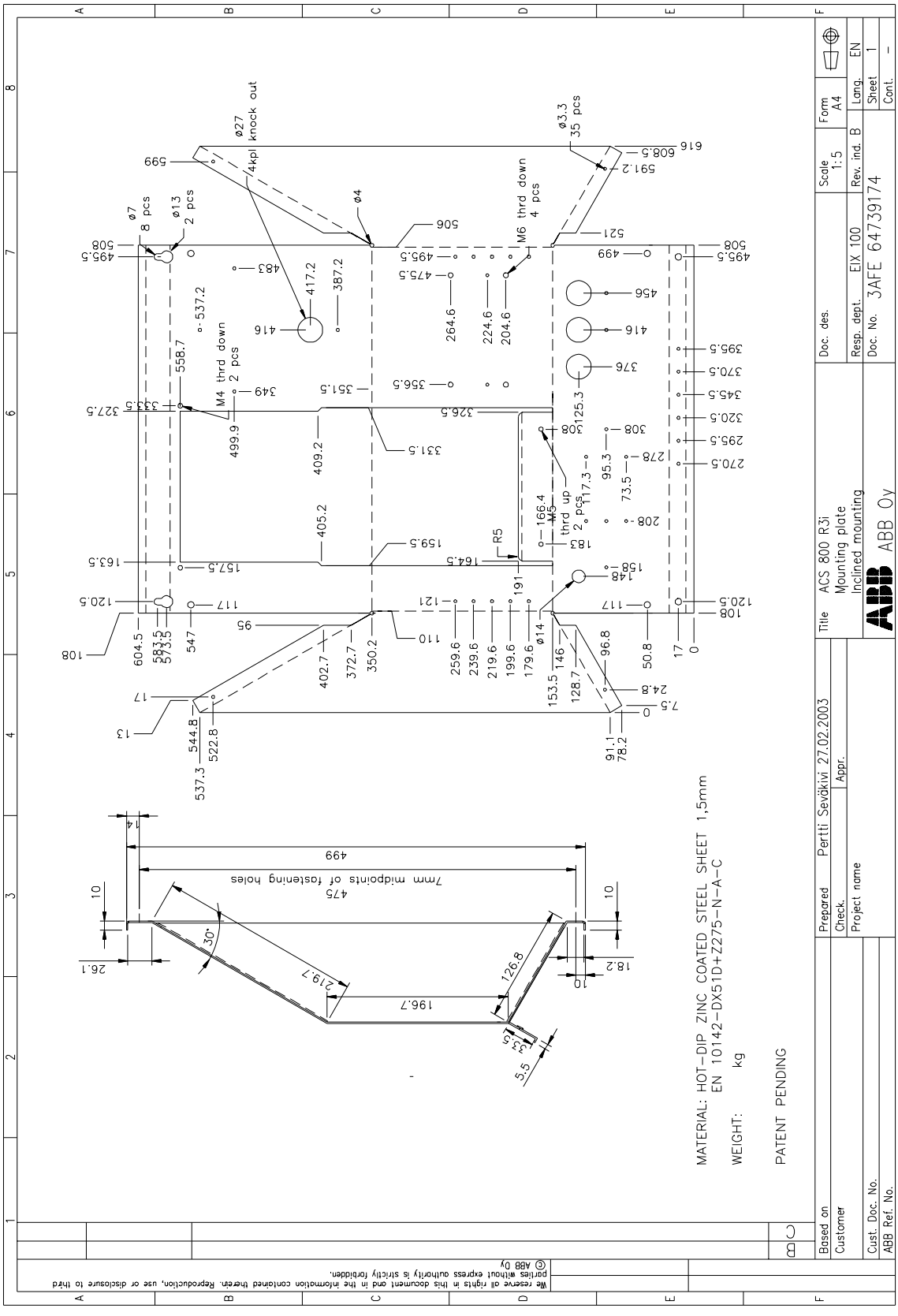
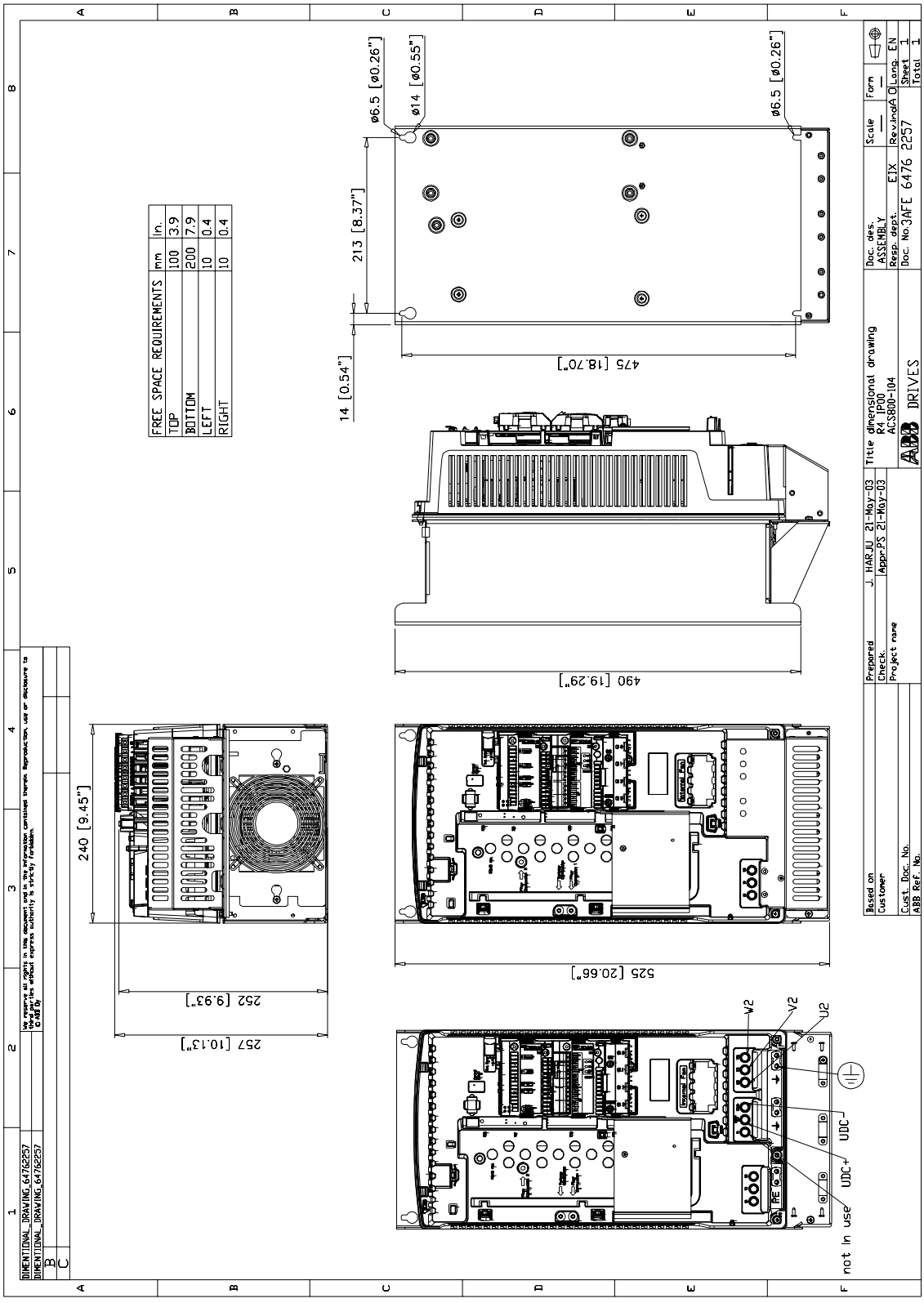
Mounting plate (inclined)

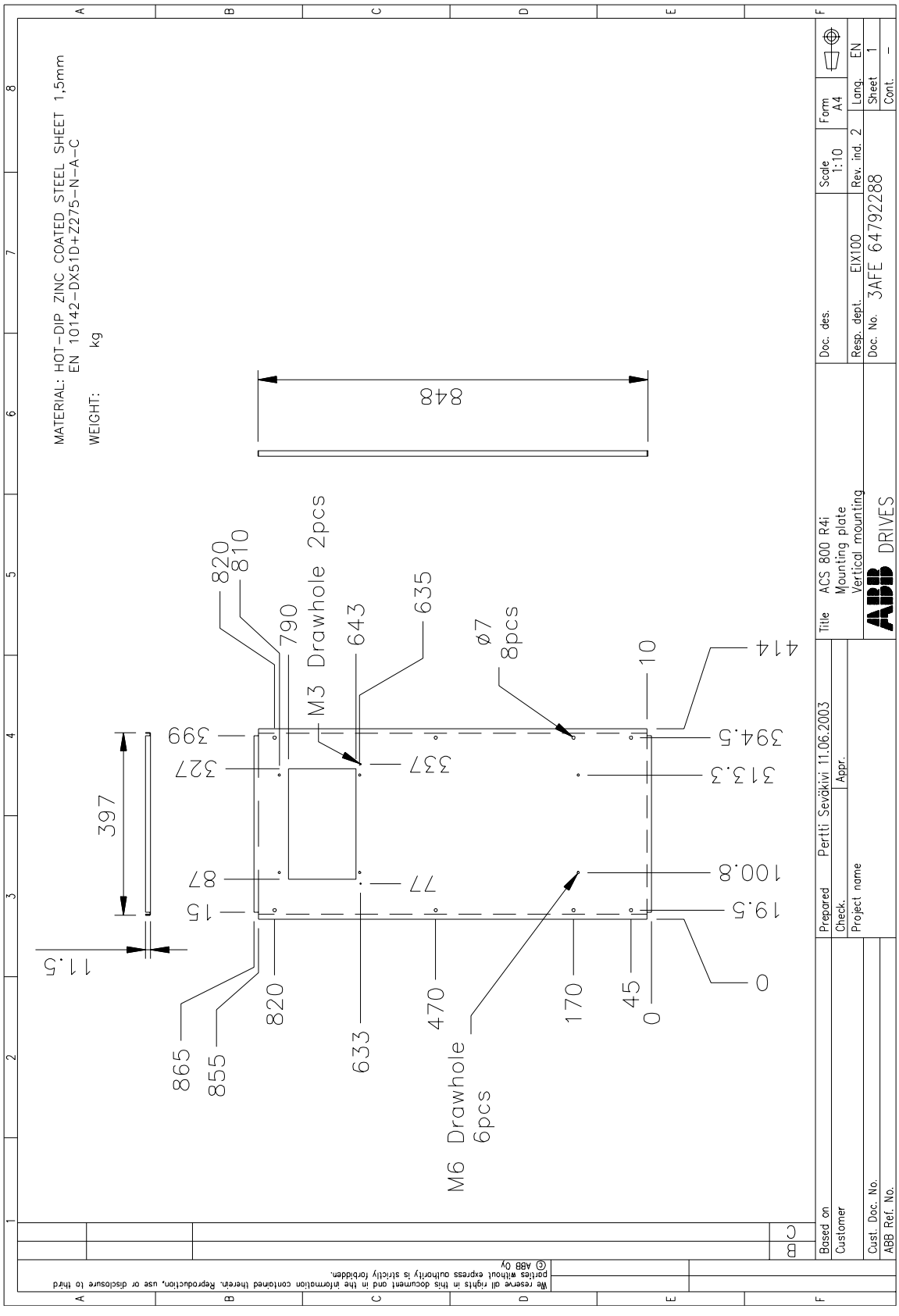


Frame R4i

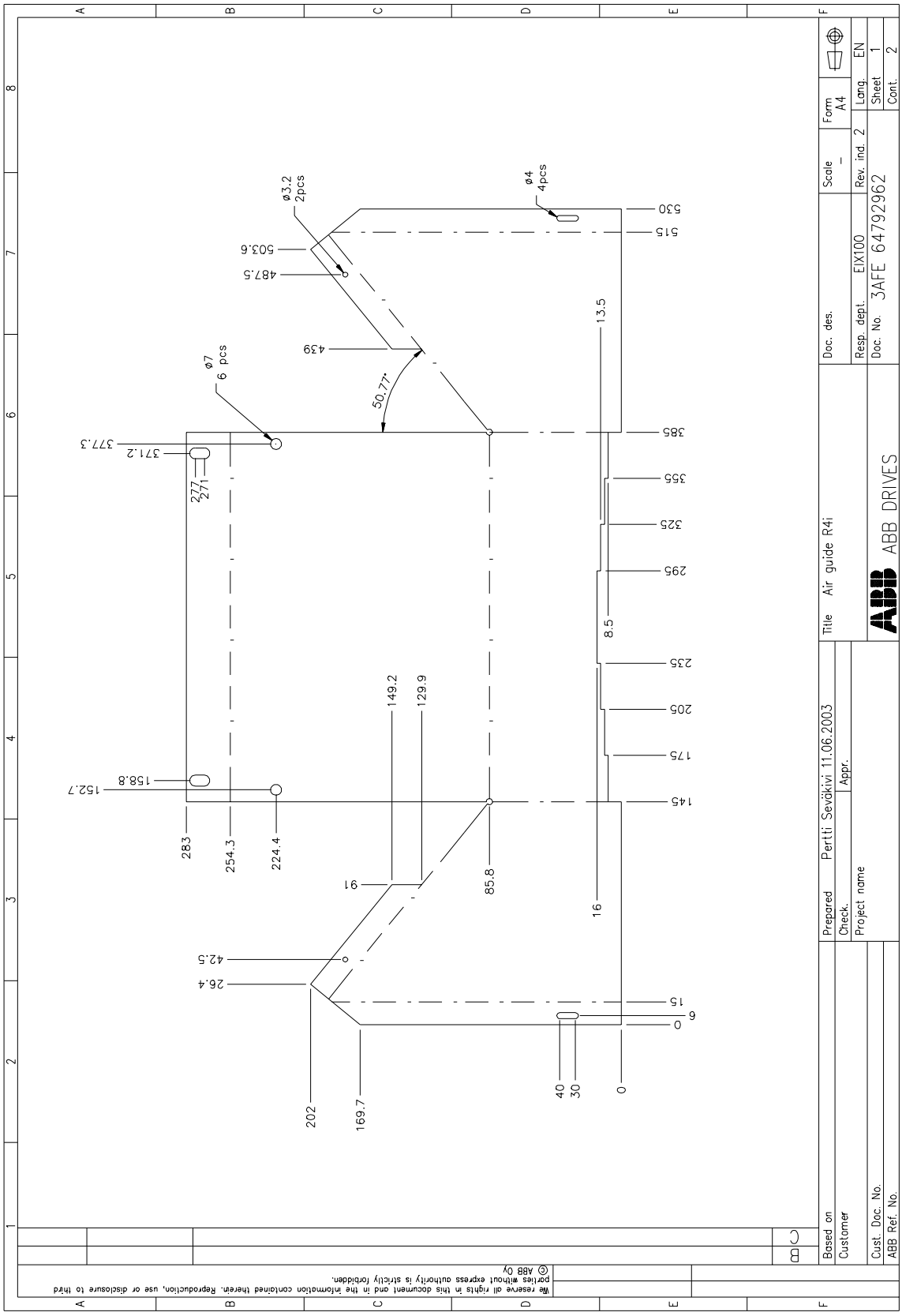
Module dimensions

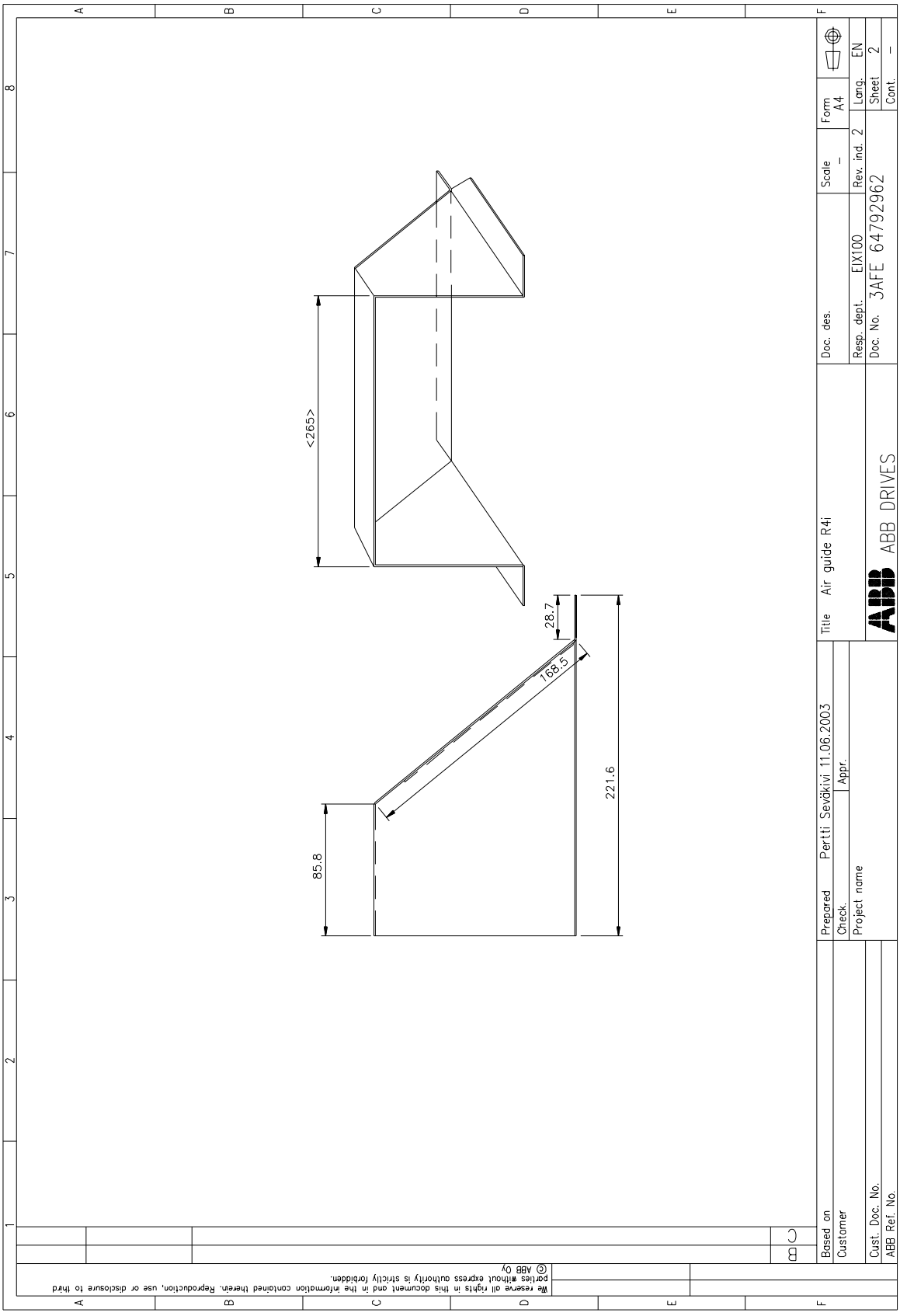


Mounting plate (vertical)



Airflow guide for vertical mounting




<265>
28.7
168.5
221.6
85.8
Title Air guide R4i
Doc. des.
Scale –
Form A4
Resp. dept. EIX100
Rev. ind. 2
Lang. EN
Doc. No. 3AFE 64792962
Sheet 2
Cont. –
ABB DRIVES
Prepared Pertti Seväkivi 11.06.2003
Check.
Appr.
Project name
Based on
Customer
Cust. Doc. No.
ABB Ref. No.
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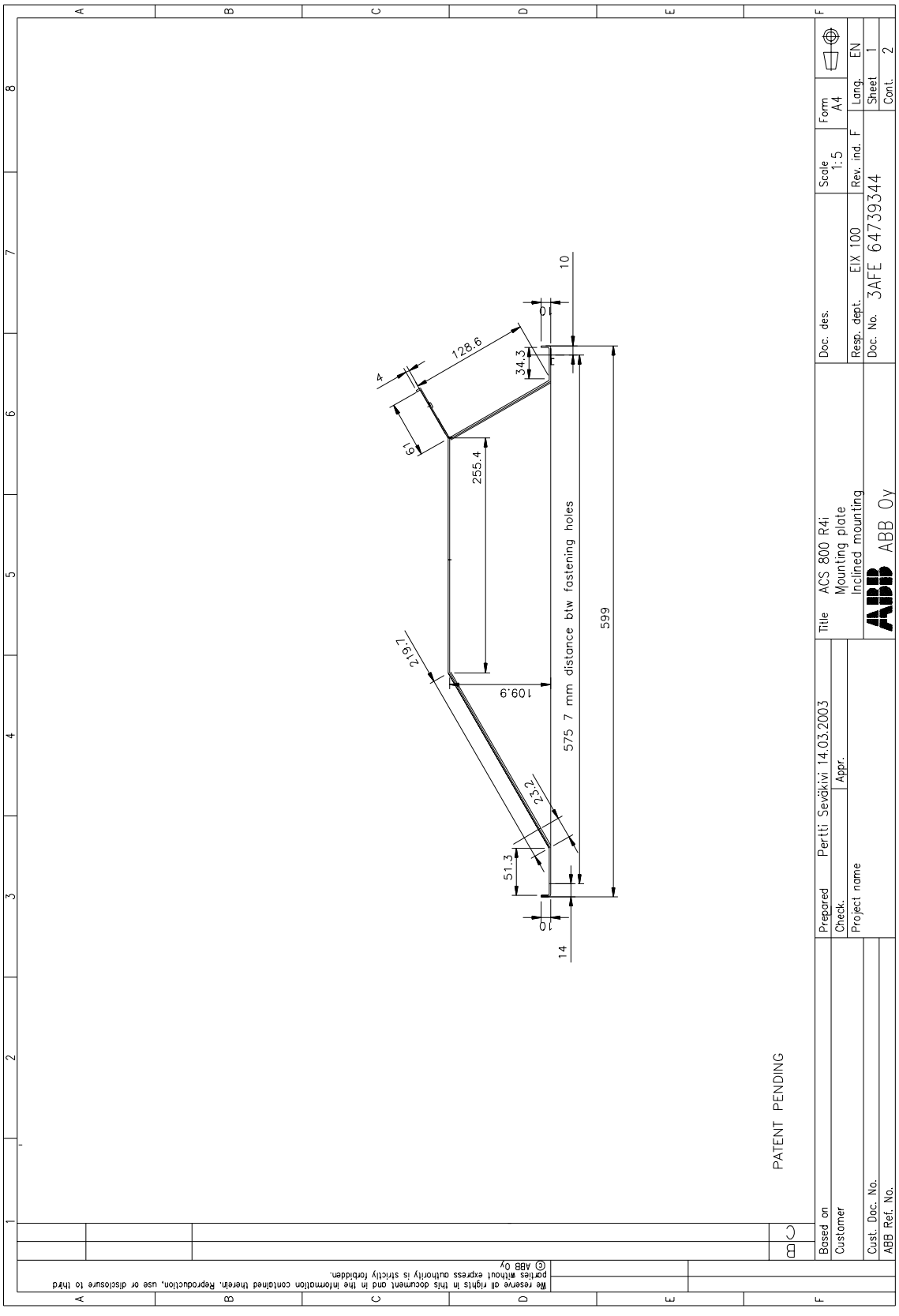
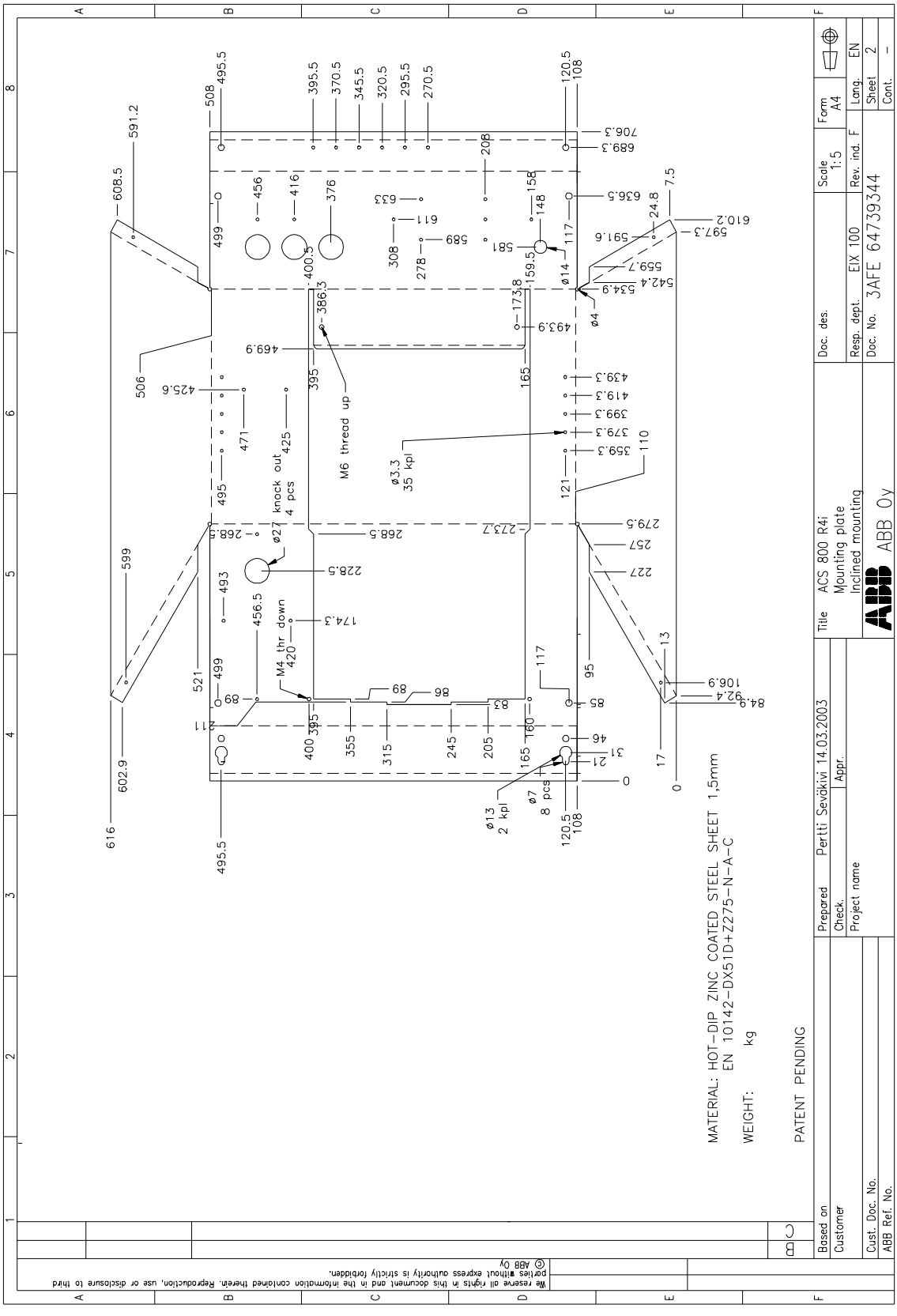
Mounting plate (inclined)




MATERIAL: HOT-DIP ZINC COATED STEEL SHEET 1,5mm
EN 10142-DX51D+Z275-N-A-C
WEIGHT: kg
PATENT PENDING
Title ACS 800 R4i
Mounting plate
Inclined mounting
ABB Oy
Doc. No. 3AFE 64739344
Scale 1:5
Form A4
Lang. EN
Sheet 2
Cont. –
Prepared Pertti Sevčkivi 14.03.2003
Check.
Appr.
Project name
Based on
Customer
Cust. Doc. No.
ABB Ref. No.
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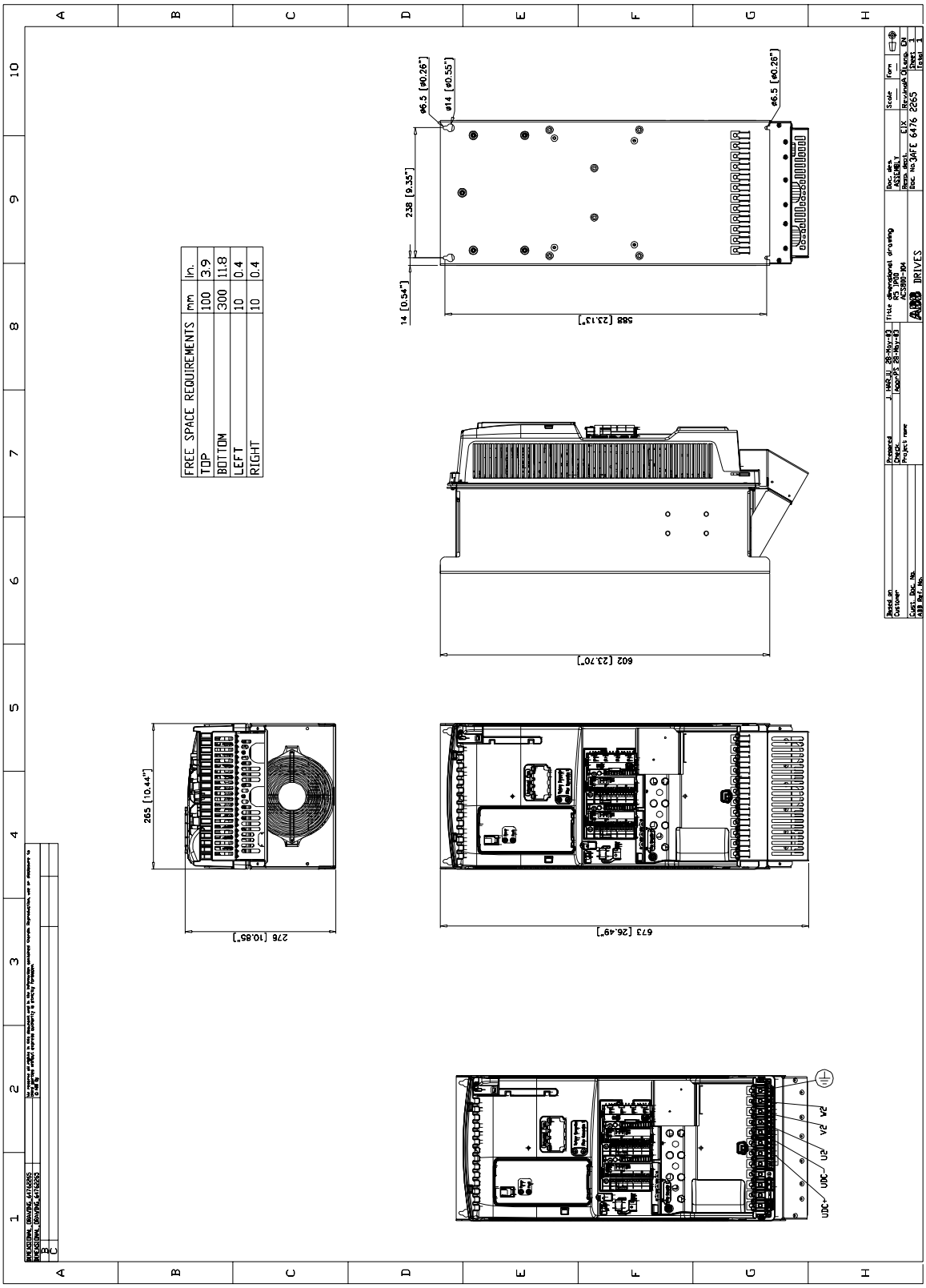
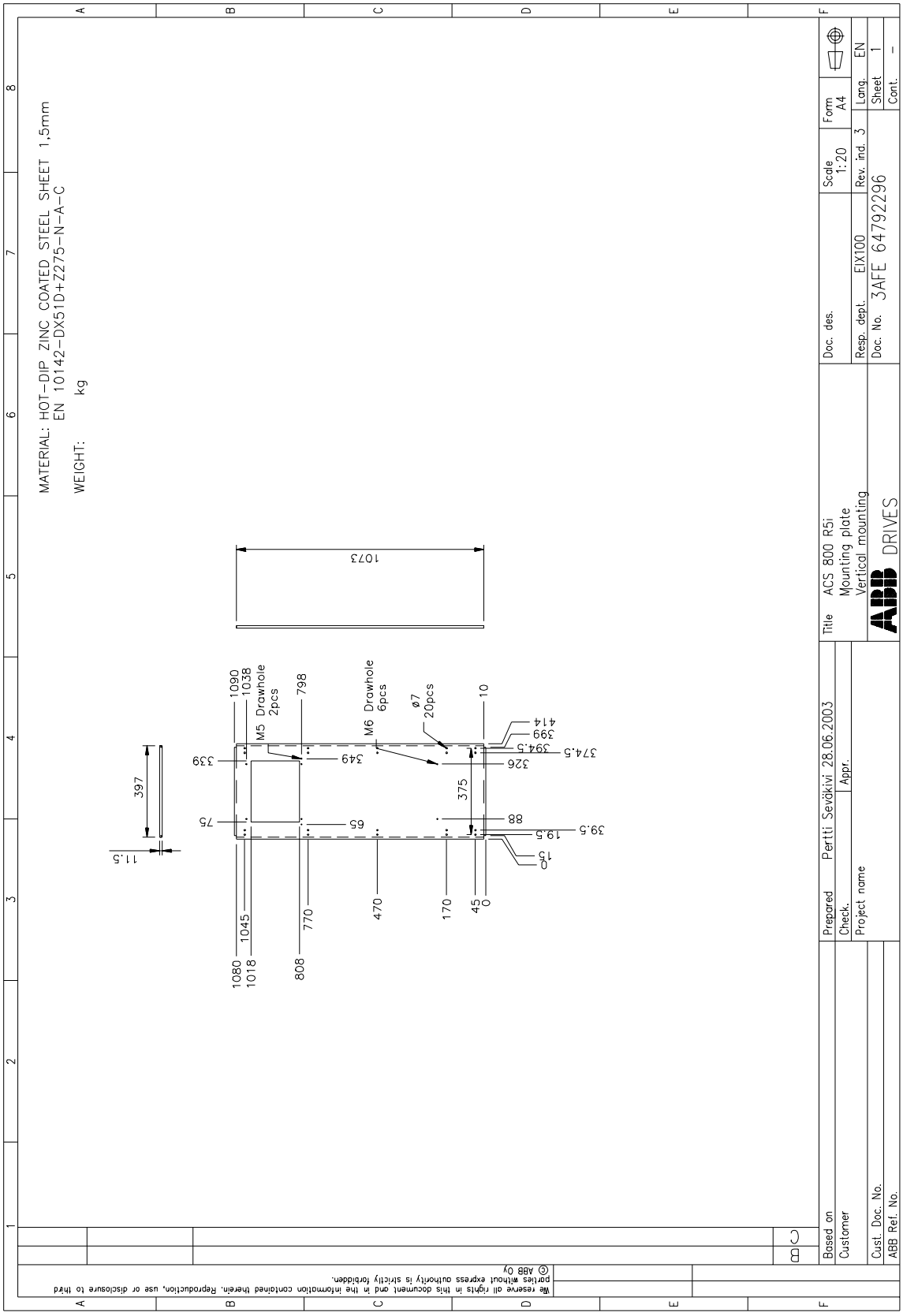
M6 thread up
ø3.3 35 kpl
knock out 4 pcs
M4 thr down
ø13 2 kpl
ø7 8 pcs
ø14
ø4

Frame R5i

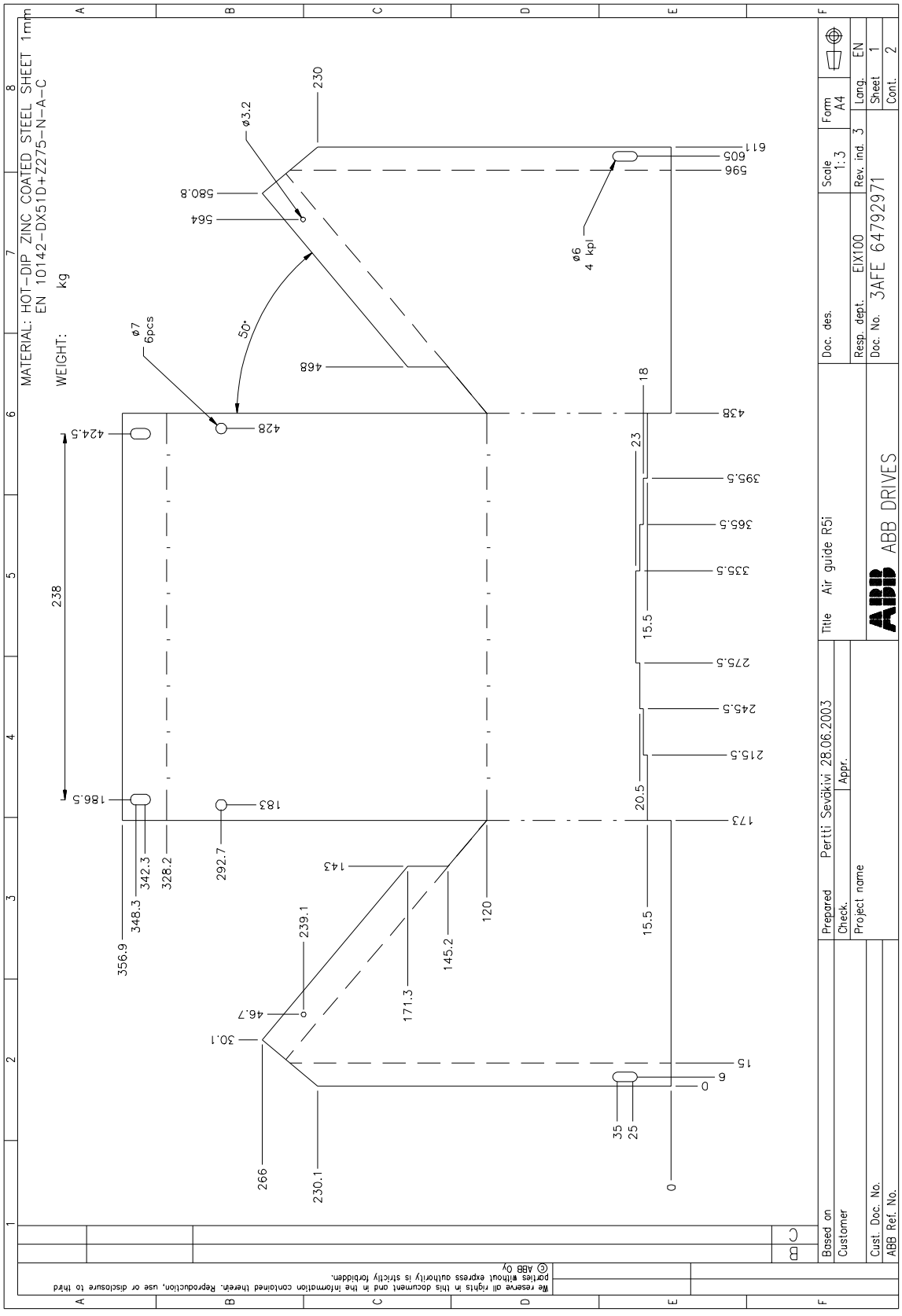
Module dimensions

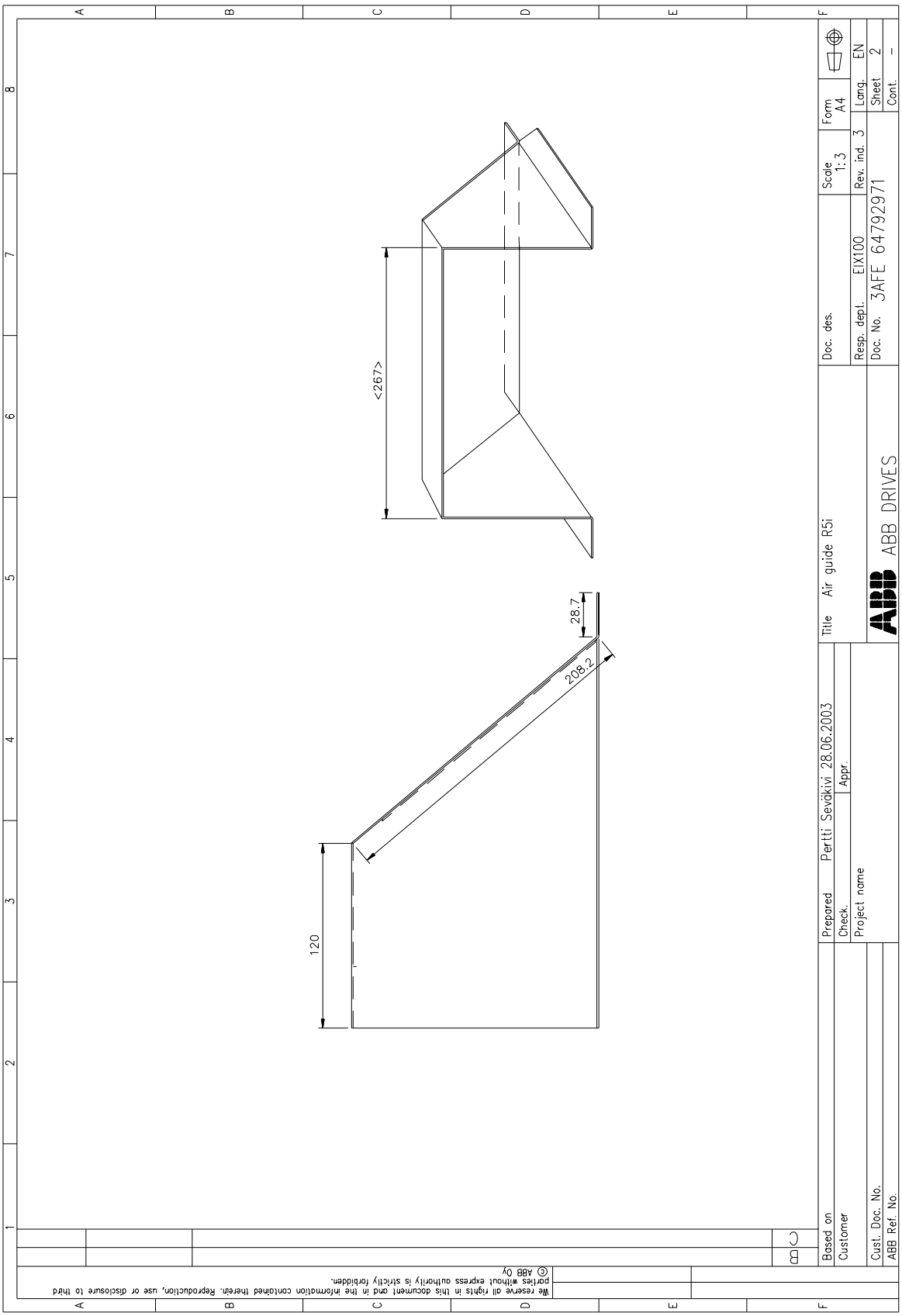


Mounting plate (vertical)



Airflow guide for vertical mounting




<267>
28.7
208.2
120
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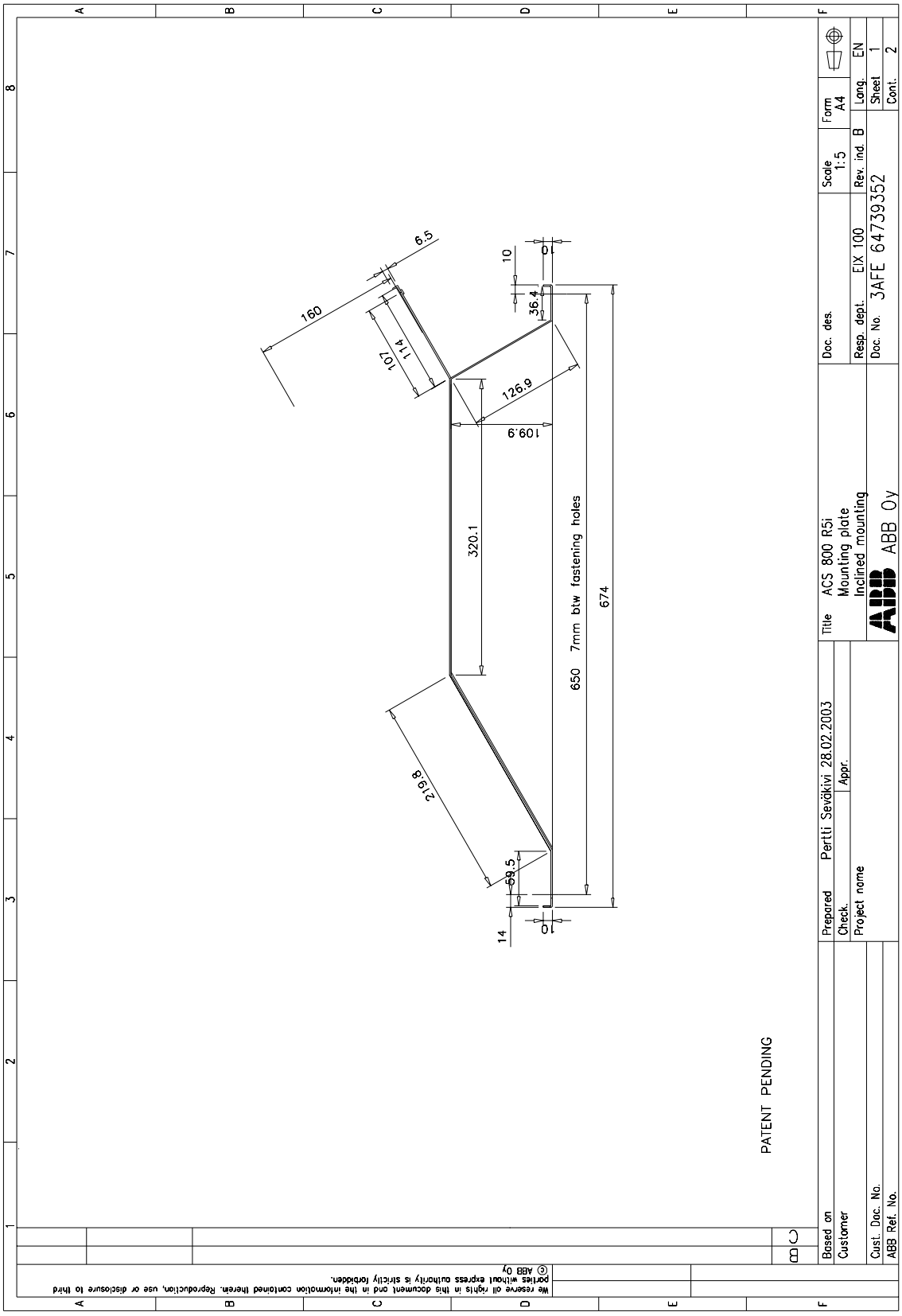
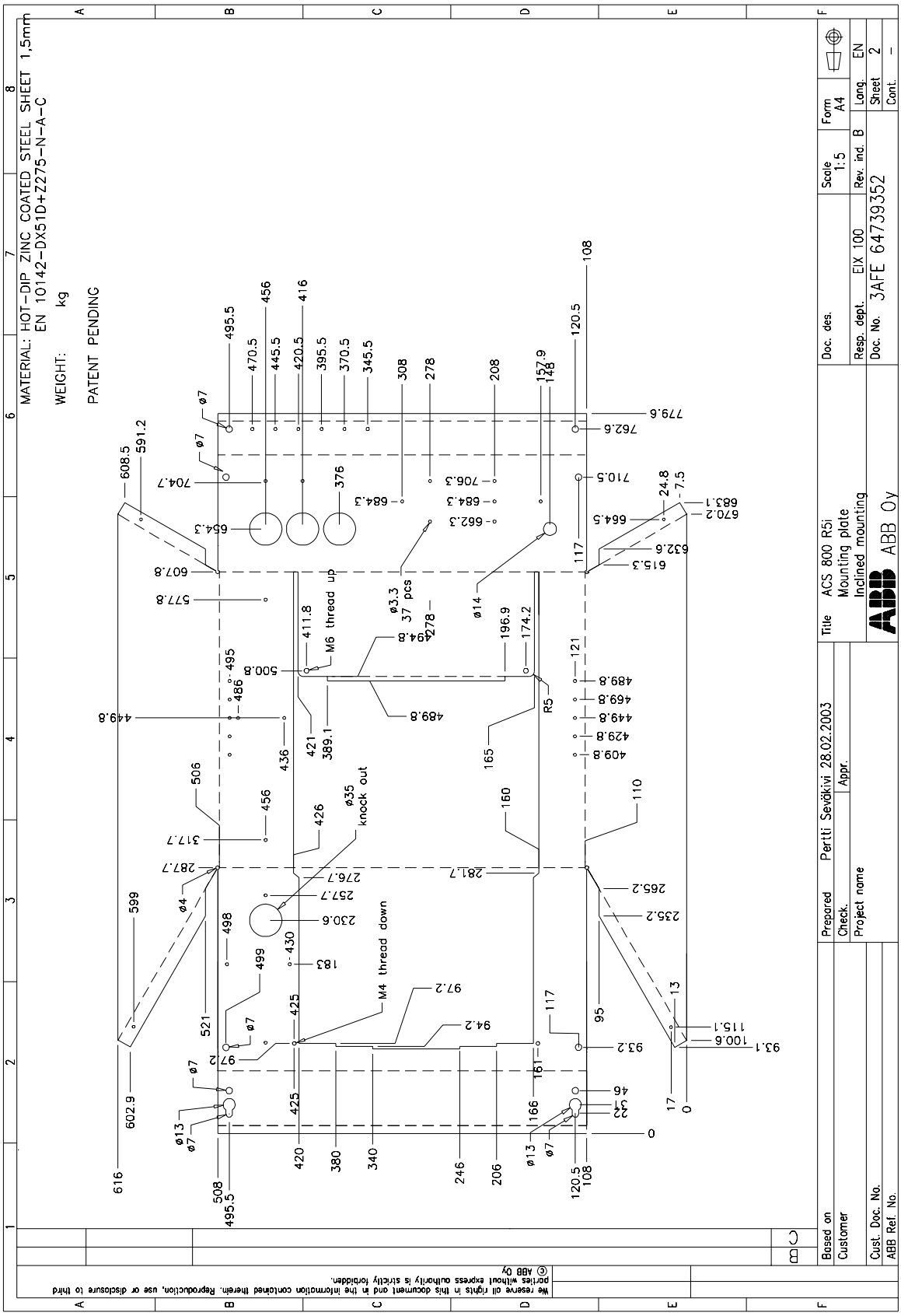
Based on
Customer
Cust. Doc. No.
ABB Ref. No.
Prepared Pertti Seväkivi 28.06.2003
Check.
Appr.
Project name
Title Air guide R5i
Doc. des.
Resp. dept. EIX100
Doc. No. 3AFE 64792971
Scale 1:3
Rev. ind. 3
Form A4
Lang. EN
Sheet 2
Cont. –
ABB DRIVES

Mounting plate (inclined)




MATERIAL: HOT-DIP ZINC COATED STEEL SHEET 1,5mm
EN 10142-DX51D+Z275-N-A-C
WEIGHT: kg
PATENT PENDING
Title ACS 800 R5i
Mounting plate
Inclined mounting
ABB Oy
Doc. No. 3AFE 64739352
Rev. ind. B
Scale 1:5
Form A4
Lang. EN
Sheet 2
Cont. –
Resp. dept. EIX 100
Doc. des.
Prepared Pertti Seväkivi 28.02.2003
Check.
Appr.
Project name
Based on
Customer
Cust. Doc. No.
ABB Ref. No.
M6 thread up
M4 thread down
ø35 knock out
37 pcs ø3.3
R5
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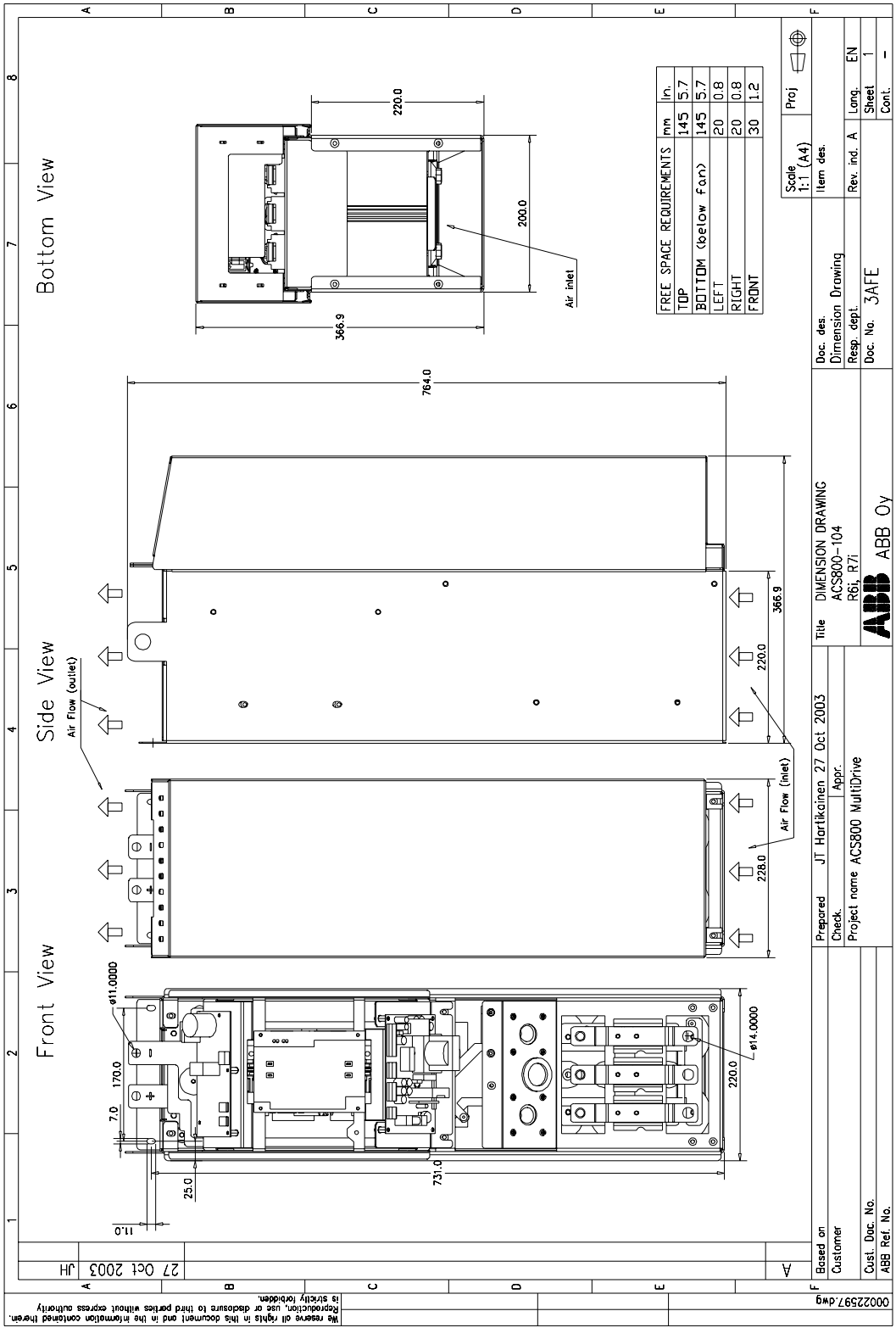
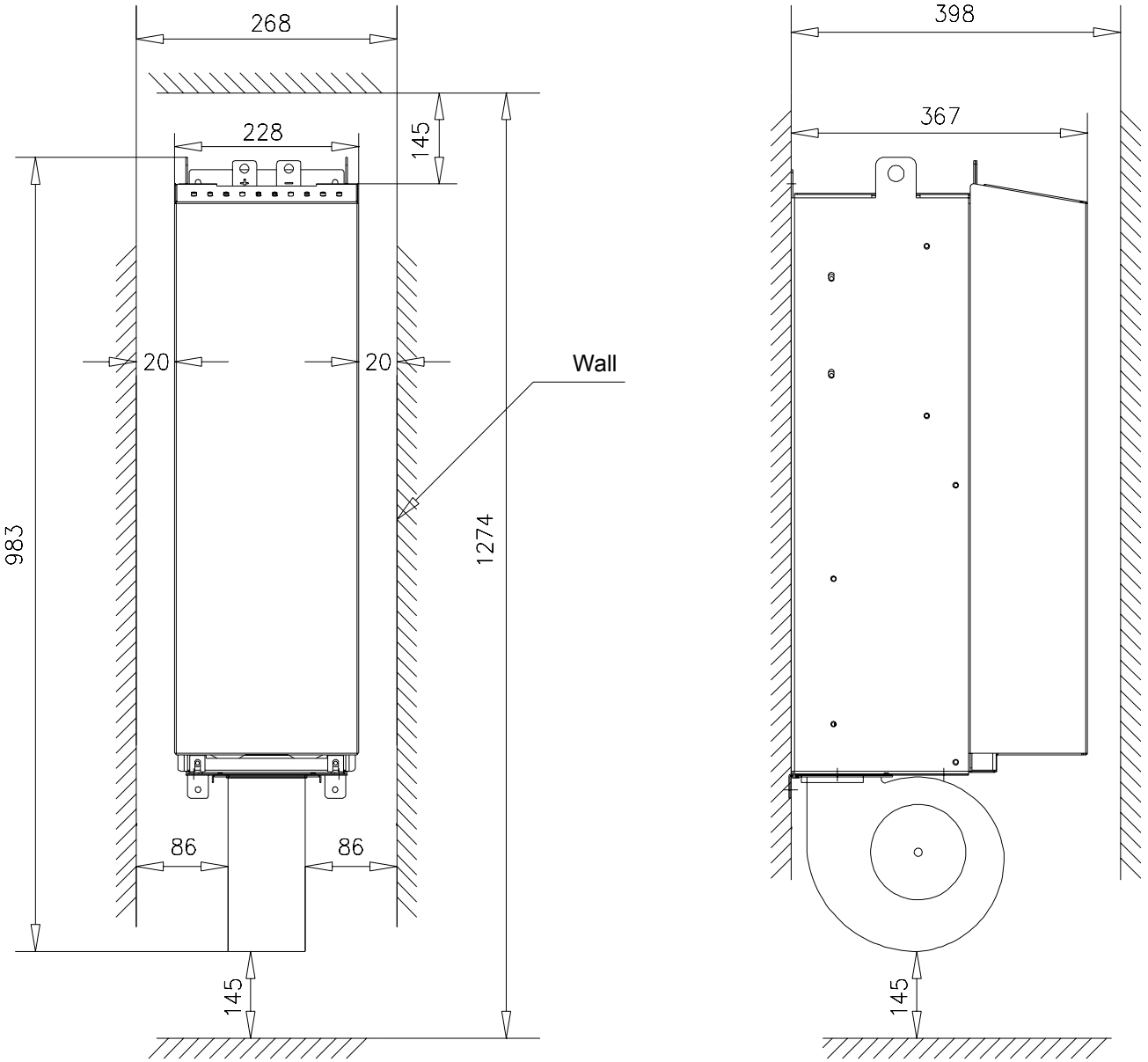
Frames R6i and R7i

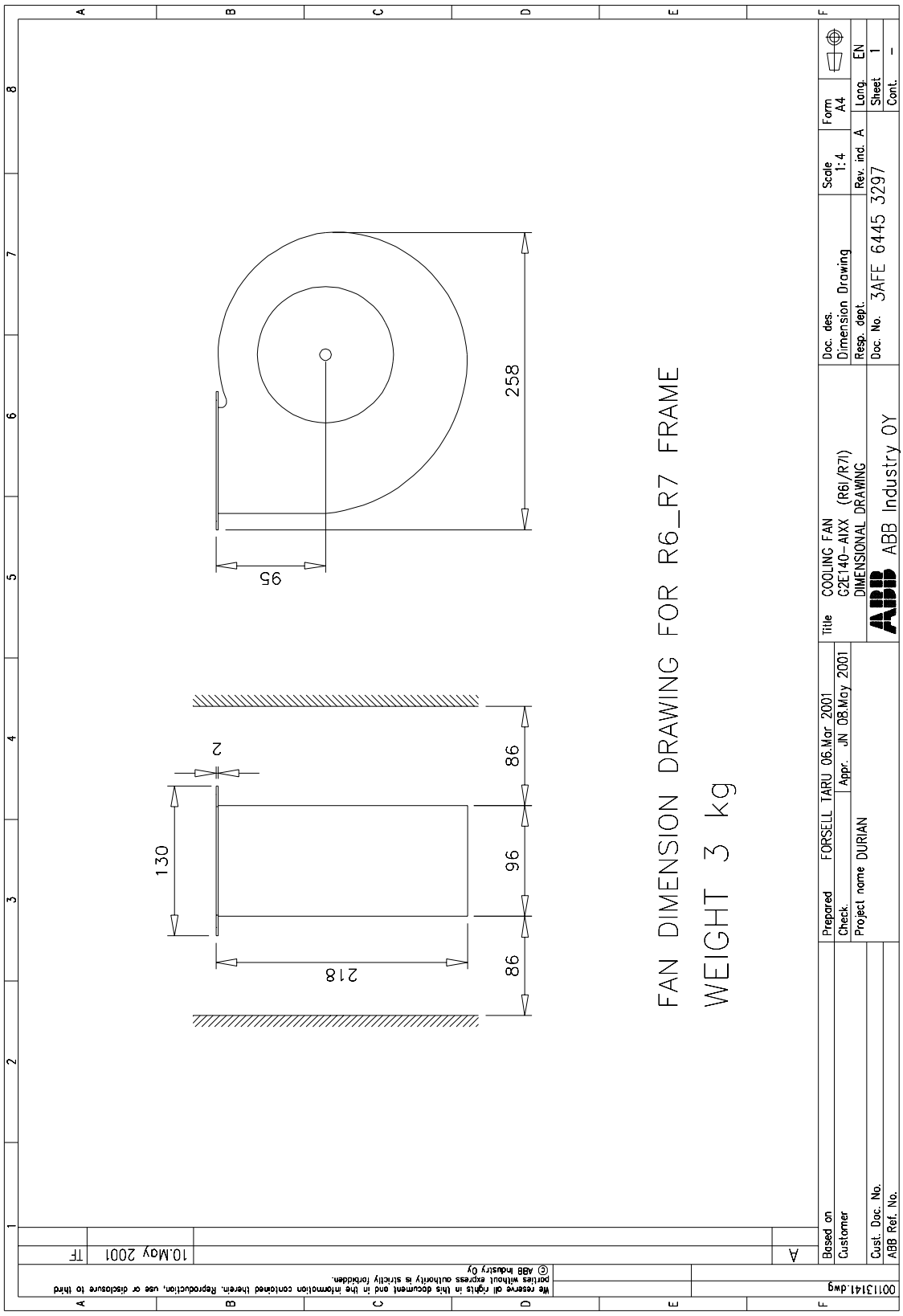
Module dimensions (excluding fan)



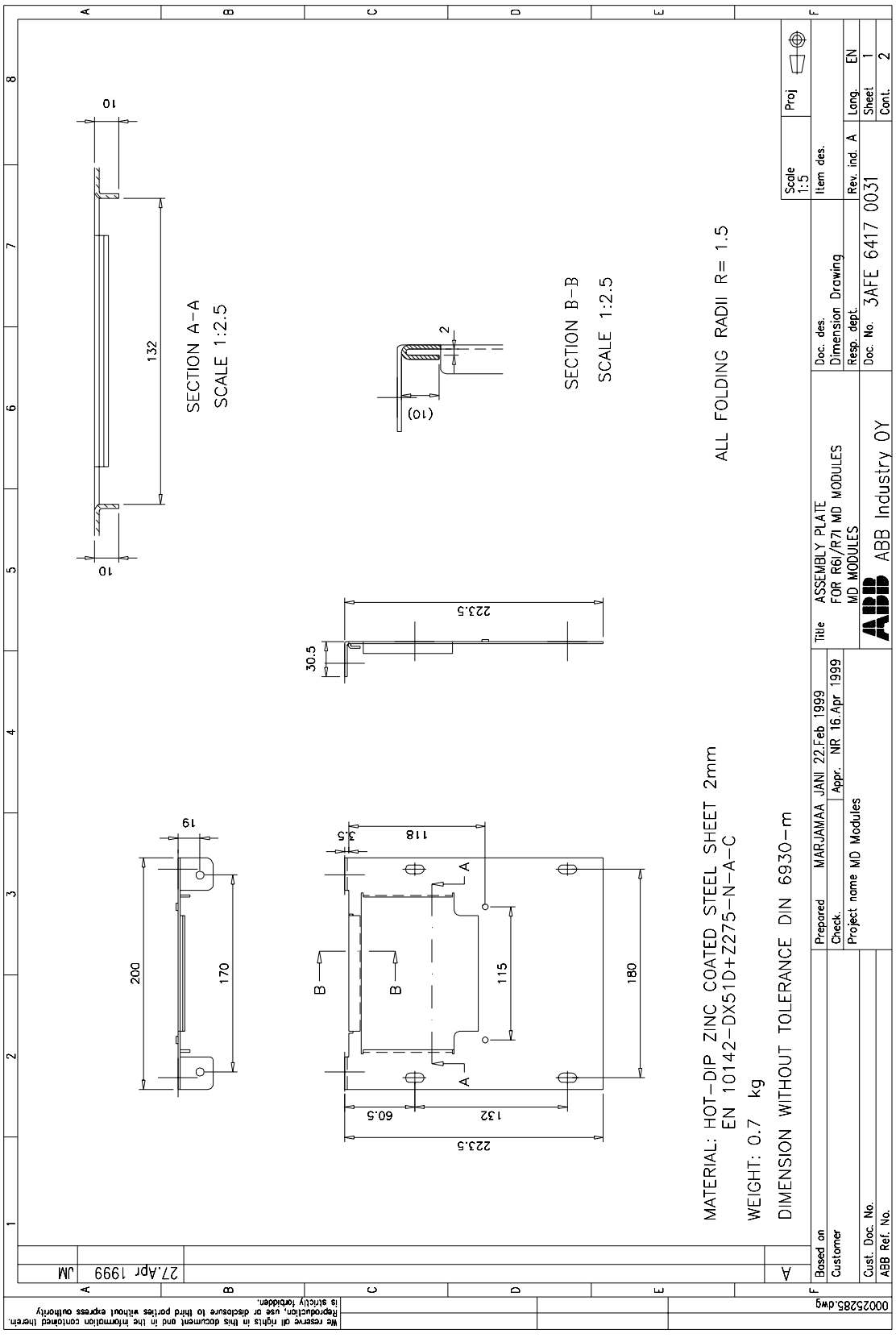
Main dimensions and clearances of module (including fan)

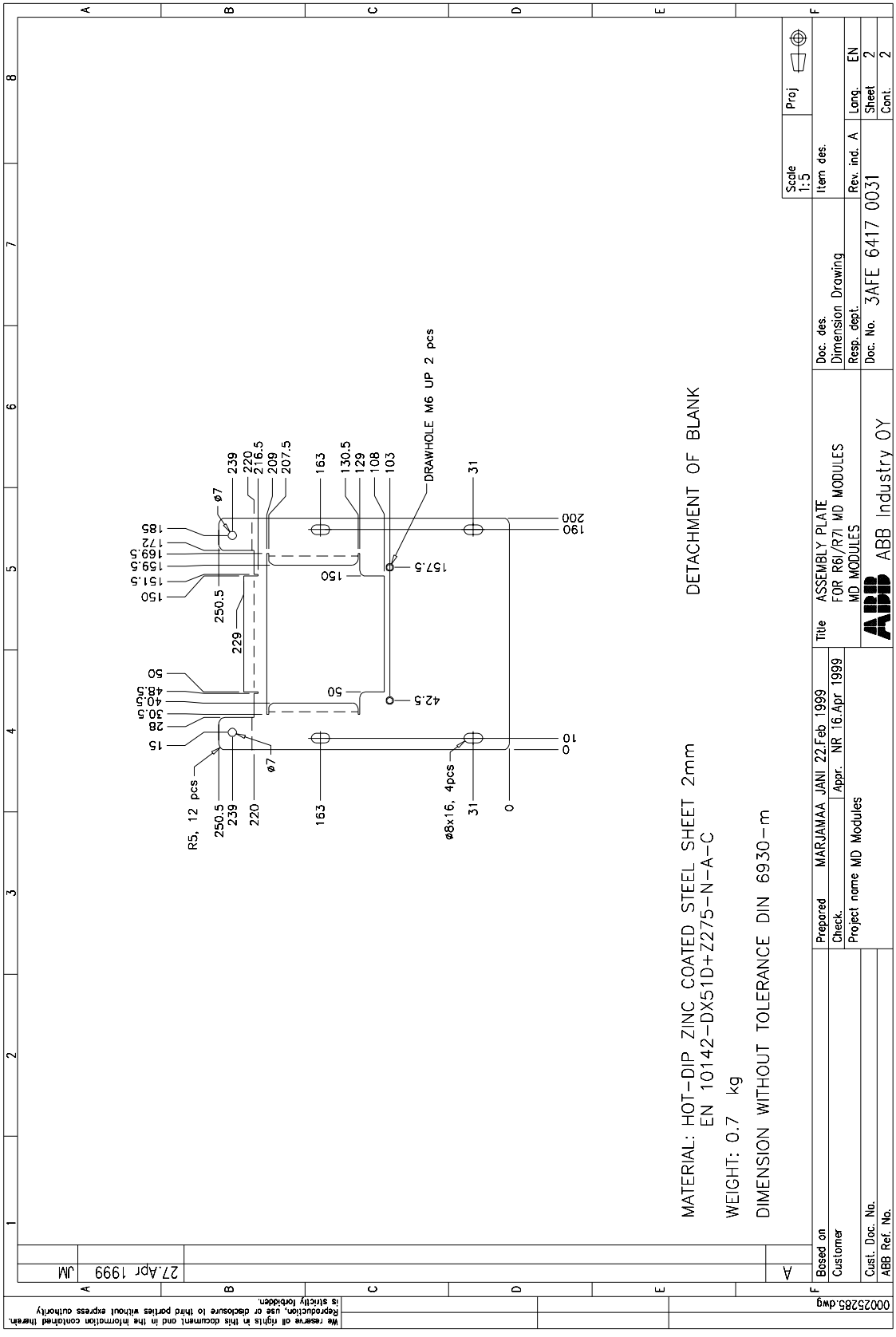


Cooling fan dimensions



Mounting plate (Kit #64138375)




DETACHMENT OF BLANK
MATERIAL: HOT-DIP ZINC COATED STEEL SHEET 2mm
EN 10142-DX51D+Z275-N-A-C
WEIGHT: 0.7 kg
DIMENSION WITHOUT TOLERANCE DIN 6930-m
DRAWHOLE M6 UP 2 pcs
R5, 12 pcs
ø8x16, 4pcs
ø7
ø7
ASSEMBLY PLATE
FOR R6I/R7I MD MODULES
MD MODULES
ABB Industry OY
Doc. des. Dimension Drawing
Doc. No. 3AFE 6417 0031
Item des.
Scale 1:5
Proj
Rev. ind. A
Lang. EN
Sheet 2
Cont. 2
Prepared MARJAMAA JANI 22.Feb 1999
Check. Appr. NR 16.Apr 1999
Project name MD Modules
Based on
Customer
Cust. Doc. No.
ABB Ref. No.
27.Apr 1999 JM
0002528S.dwg
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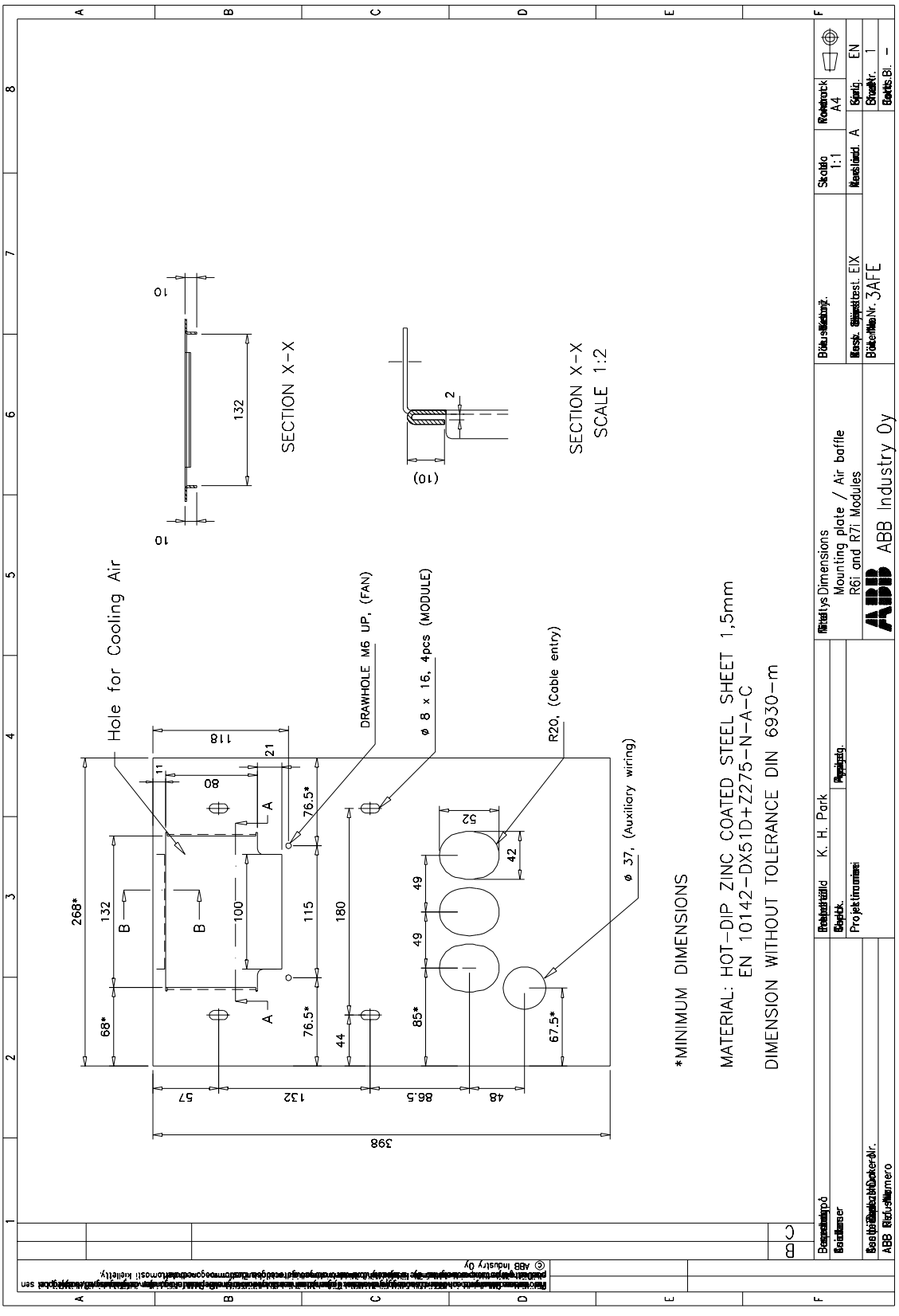
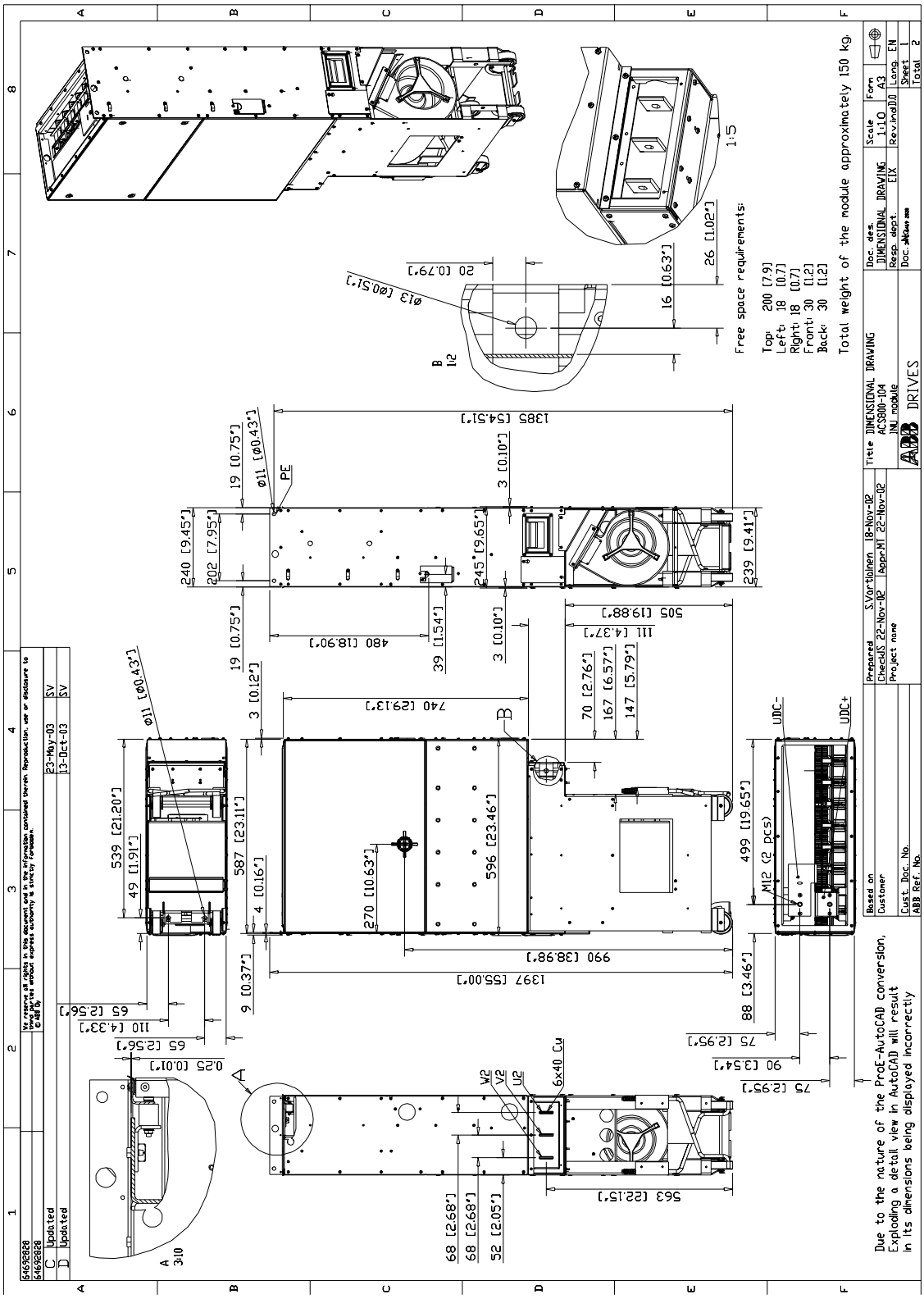
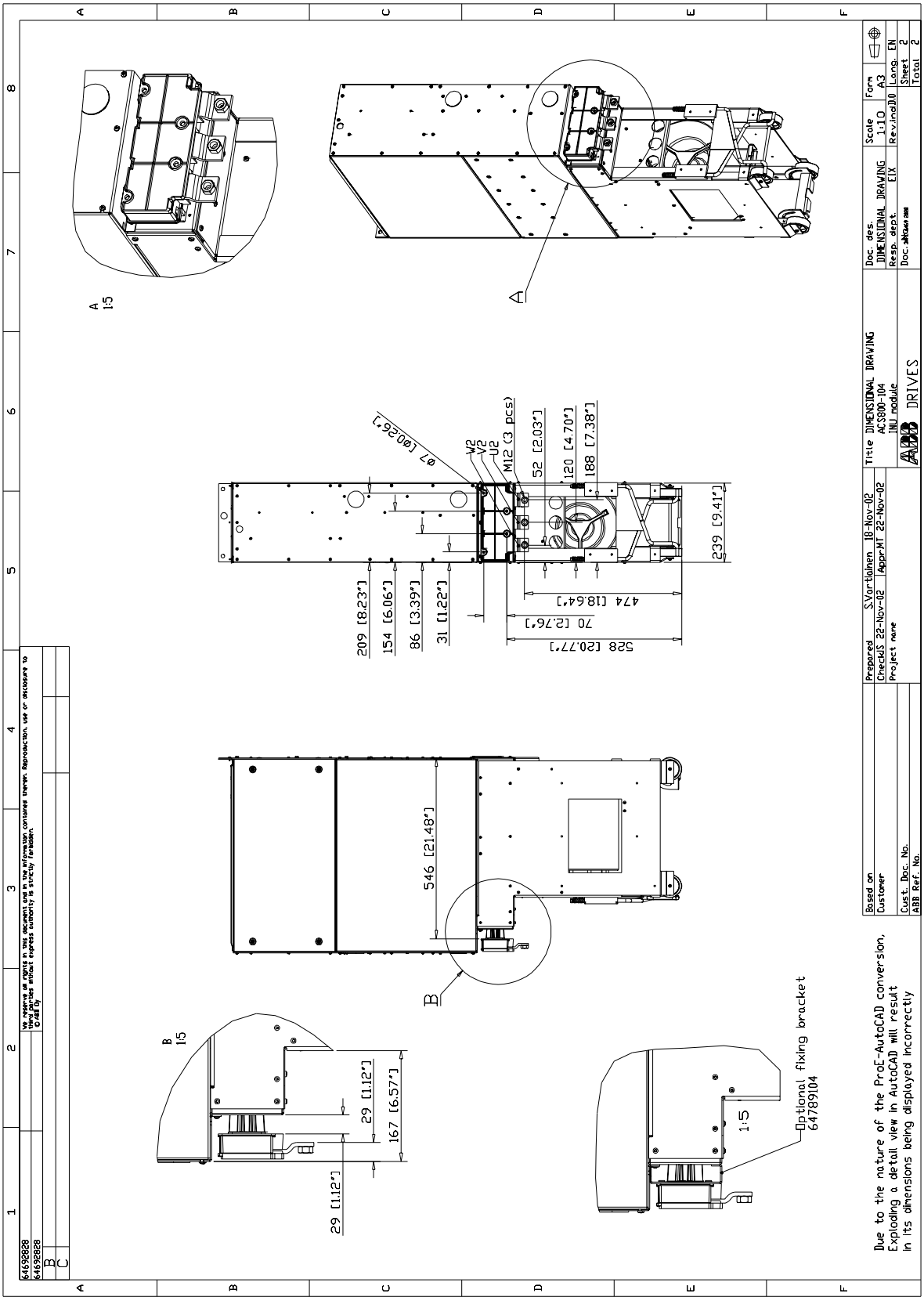
Combined mounting plate/air baffle



Frame R8i

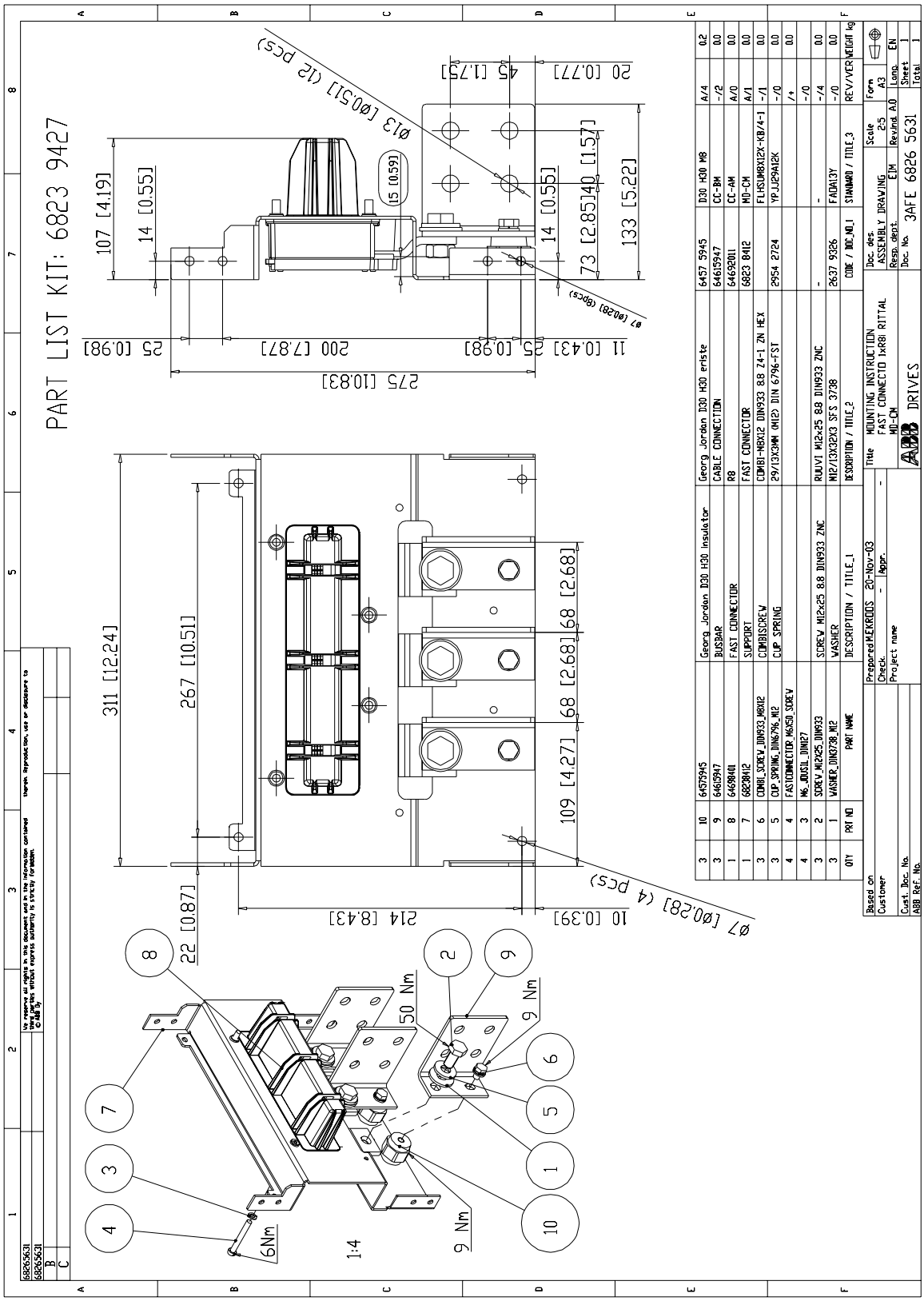
Module dimensions


Total weight of the module approximately 150 kg.
Free space requirements:
Top: 200 [7.9]
Left: 18 [0.7]
Right: 18 [0.7]
Front: 30 [1.2]
Back: 30 [1.2]
Due to the nature of the ProE-AutoCAD conversion,
Exploding a detail view in AutoCAD will result
in its dimensions being displayed incorrectly
DRIVES

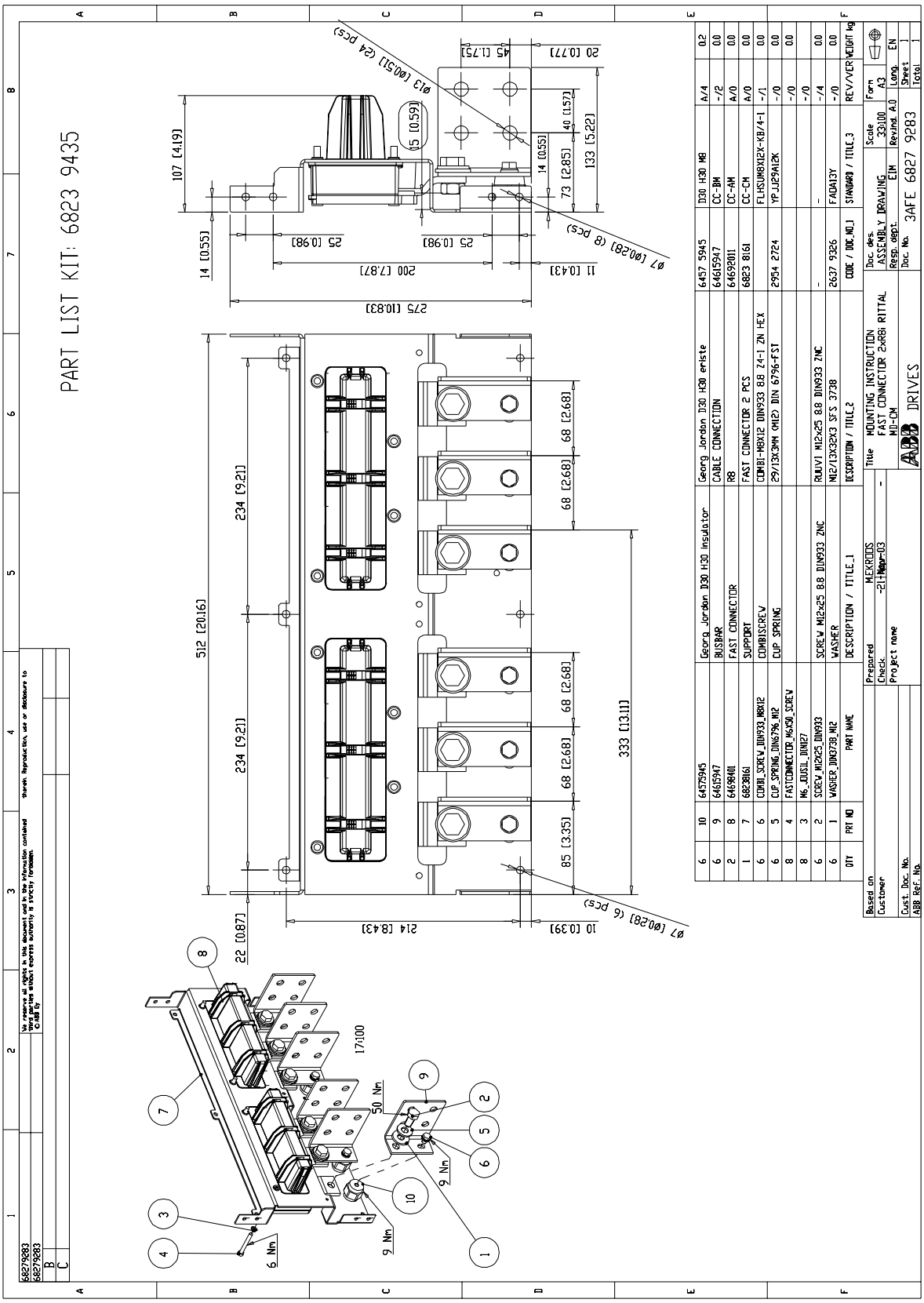

A
1:5
A
B
1:5
B
1:5
Ø7 [0.26"]
W2
V2
U2
M12 (3 pcs)
52 [2.03"]
120 [4.70"]
188 [7.38"]
239 [9.41"]
209 [8.23"]
154 [6.06"]
86 [3.39"]
31 [1.22"]
474 [18.64"]
70 [2.76"]
528 [20.77"]
546 [21.48"]
29 [1.12"]
167 [6.57"]
29 [1.12"]
Optional fixing bracket
64789104
Due to the nature of the ProE-AutoCAD conversion,
Exploding a detail view in AutoCAD will result
in its dimensions being displayed incorrectly
Based on
Customer
Cust. Doc. No.
ABB Ref. No.
Prepared S.Vartiainen 18-Nov-02
CheckS 22-Nov-02 ApprMT 22-Nov-02
Project name
Title DIMENSIONAL DRAWING
ACS800-104
INU module
ABB DRIVES
Doc. des
DIMENSIONAL DRAWING
Resp. dept. LTX
Doc. number
Scale 1:10
RevisionUID
Form A3
Lang. EN
Sheet 2
Total 2
64592828
64592828
B
C

Quick connector chassis socket kits

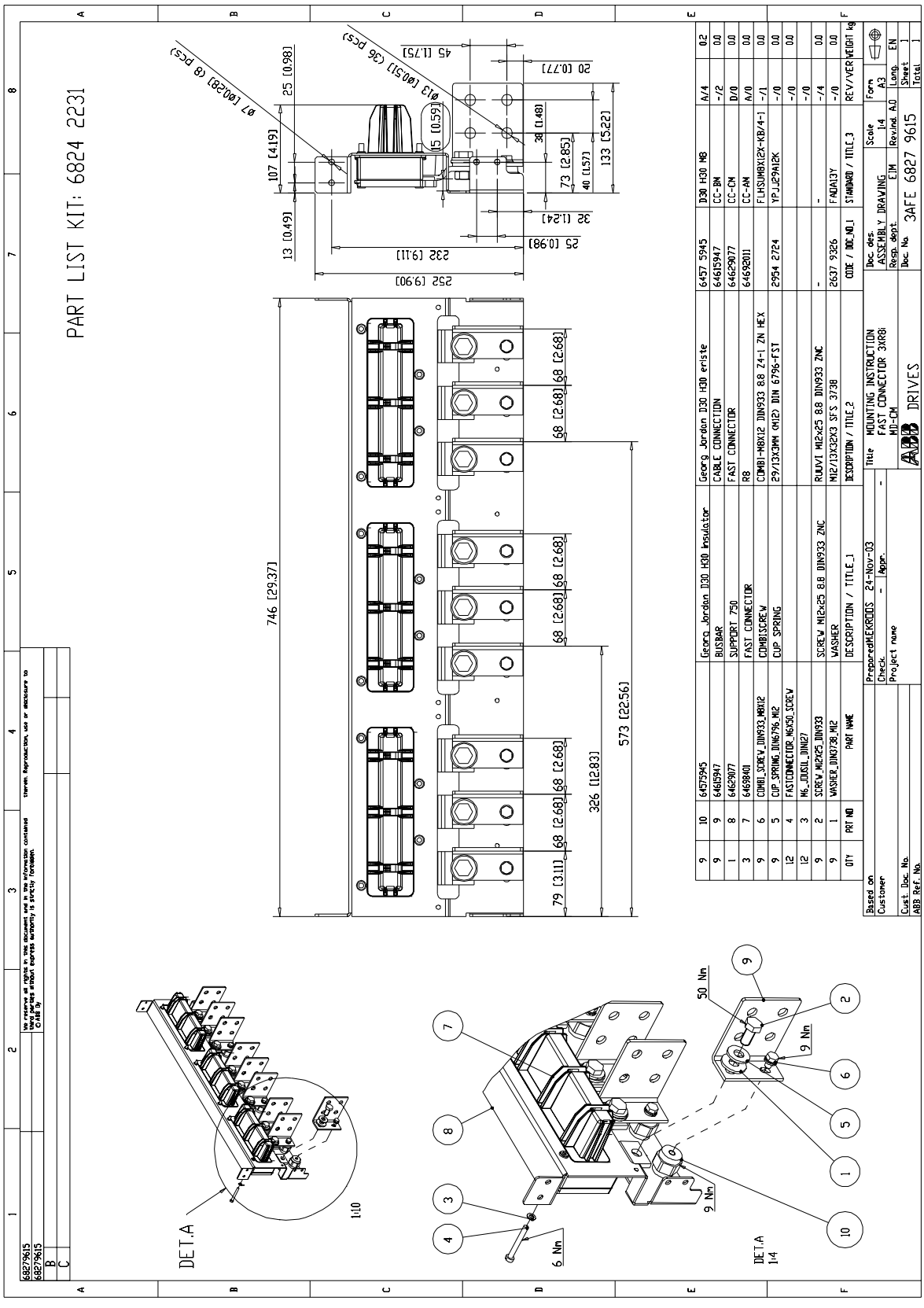
Kit #68239427



Kit #68239435

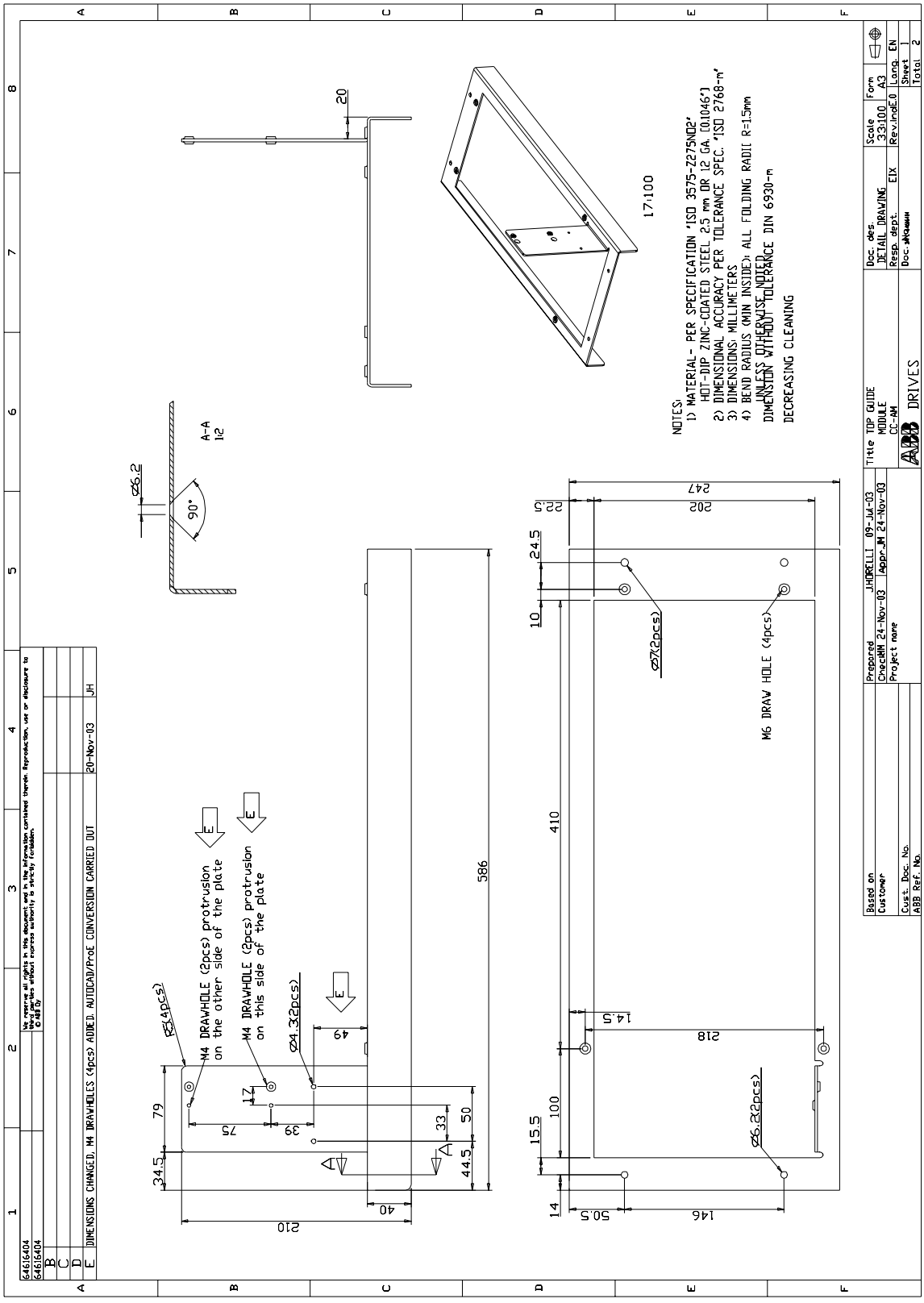


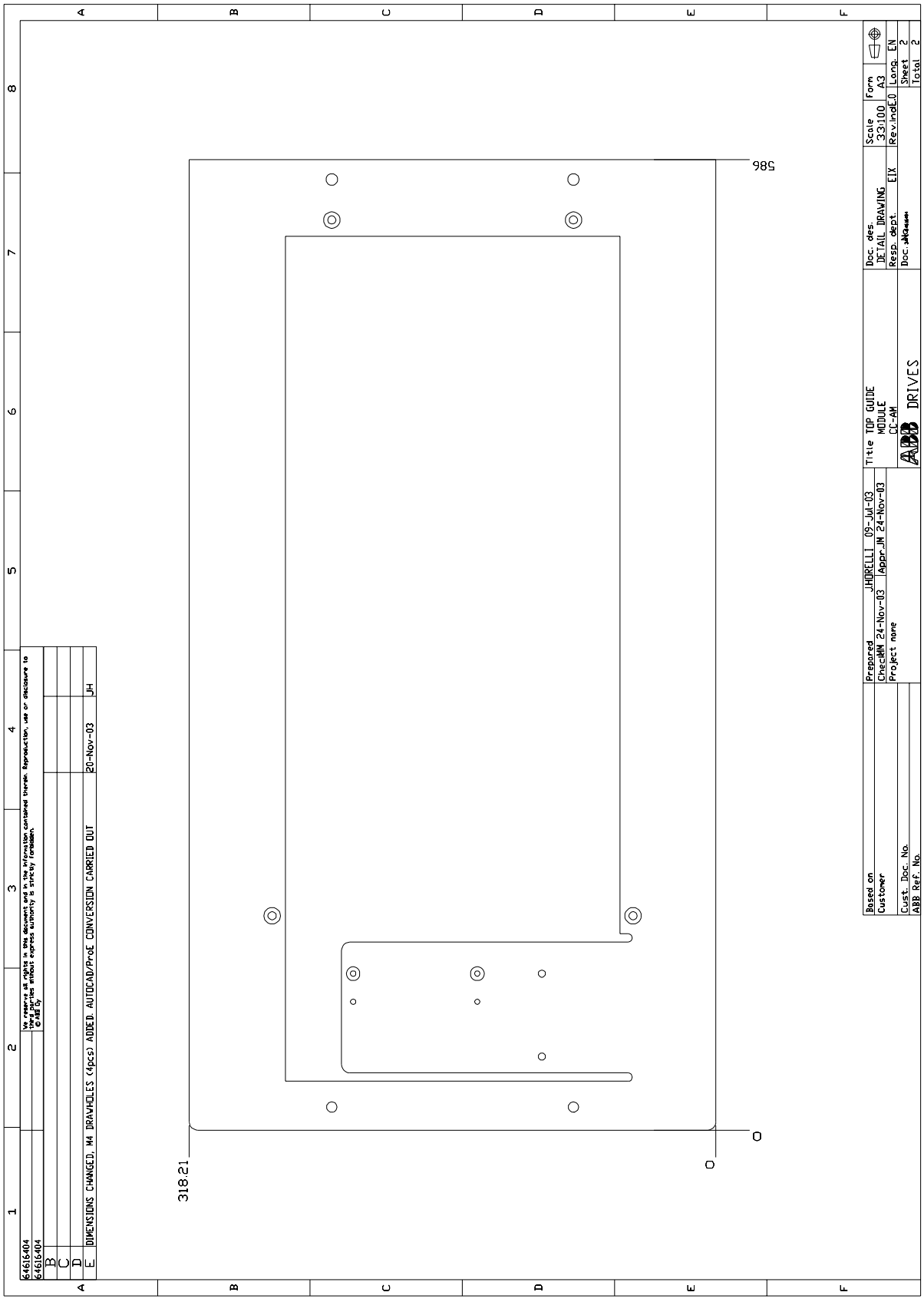
Kit #68242231



Module guiding parts

Upper guide




64616404
64616404
B
C
D
E DIMENSIONS CHANGED, M4 DRAWHOLES (4pcs) ADDED. AUTOCAD/ProE CONVERSION CARRIED OUT 20-Nov-03 JH
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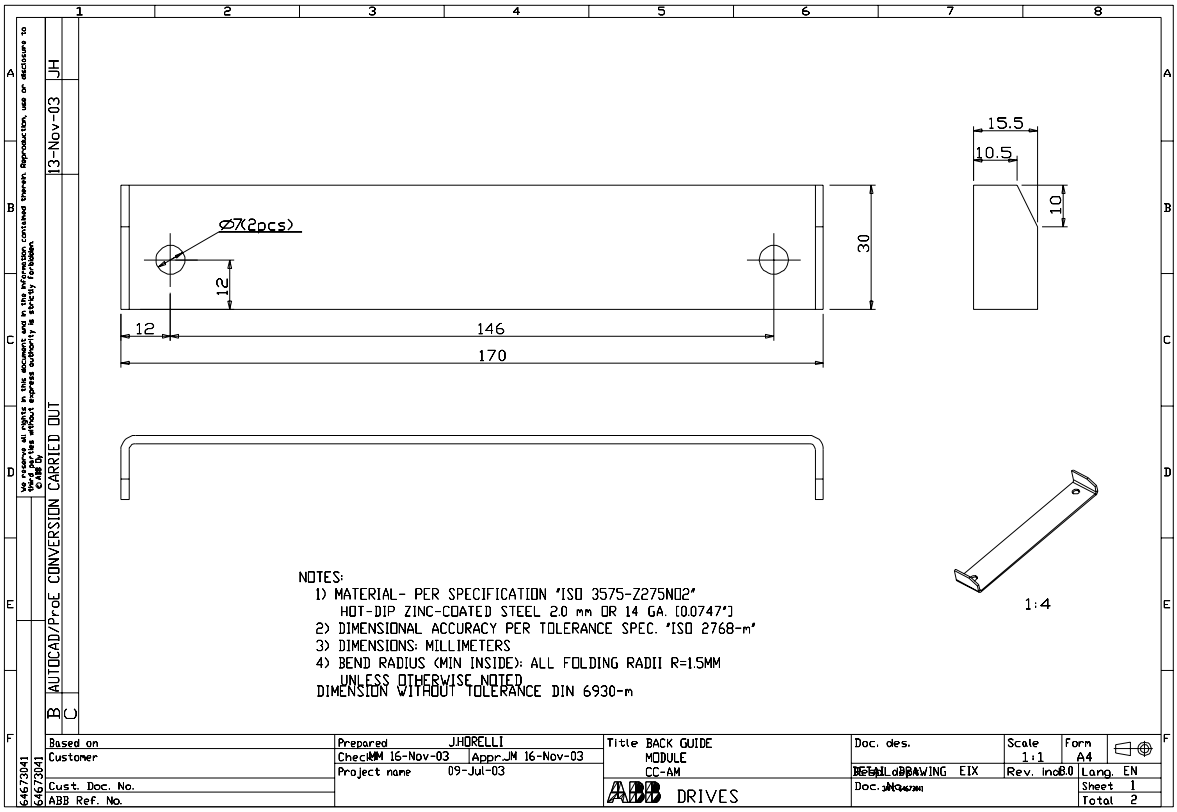
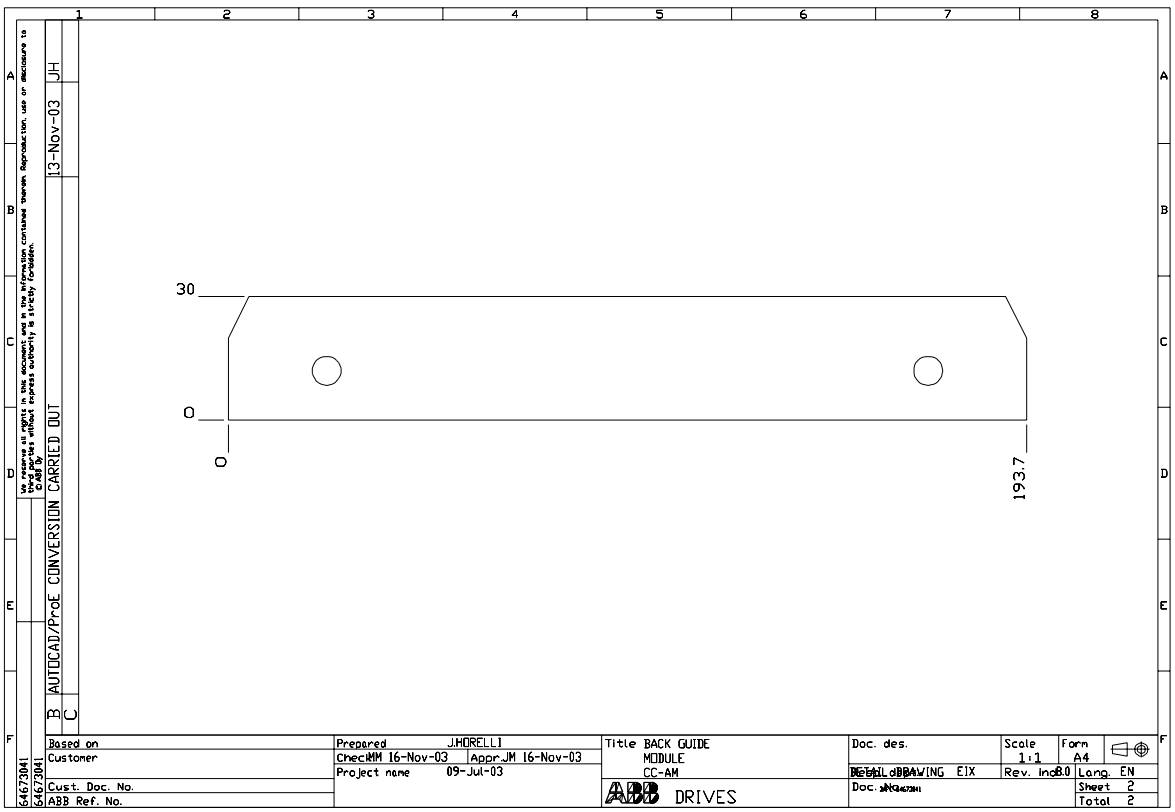
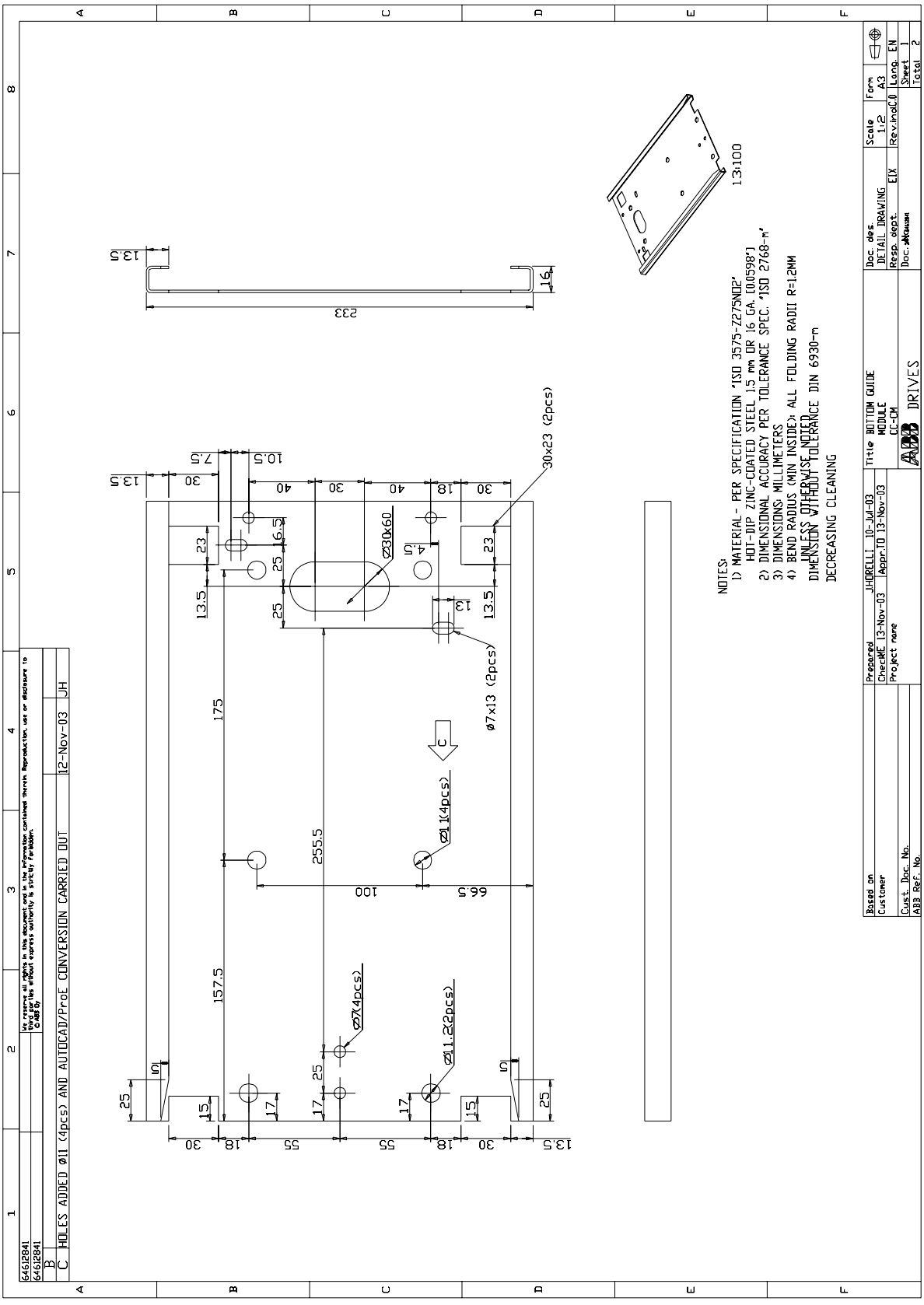
318.21
586
0
0
Based on
Customer
Cust. Doc. No.
ABB Ref. No.
Prepared JHORELLI 09-Jul-03
Check MN 24-Nov-03
Appr. JM 24-Nov-03
Project name
Title TOP GUIDE MODULE CC-AM
ABB DRIVES
Doc. des DETAIL DRAWING
Resp. dept. EIX
Doc. number
Scale 33100
Form A3
Rev.index 0
Long. EN
Sheet 2
Total 2

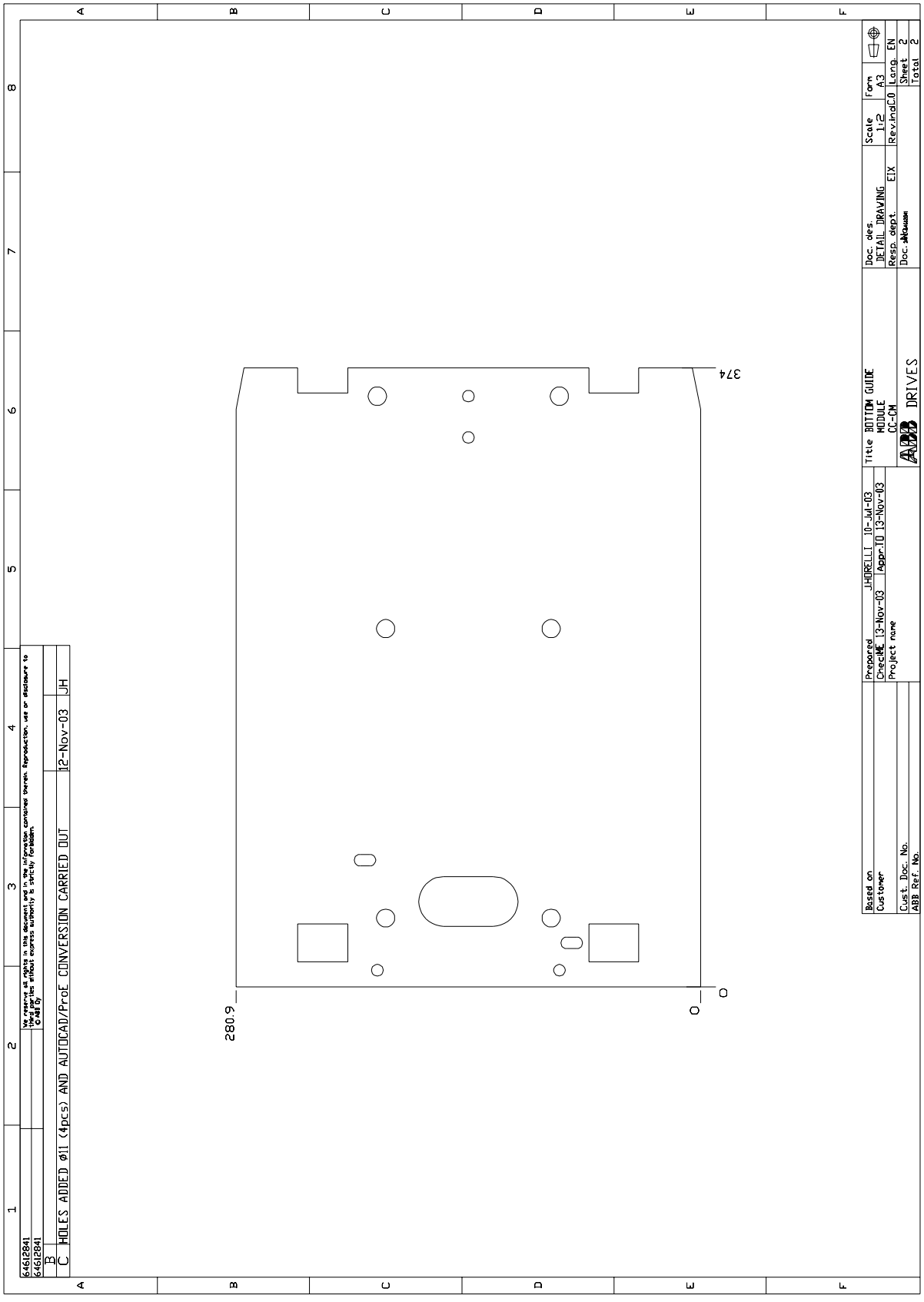
Rear upper guide





Lower guide


NOTES:
1) MATERIAL - PER SPECIFICATION "ISO 3575-Z275ND2"
HOT-DIP ZINC-COATED STEEL 1.5 mm DR 16 GA. [0.0598"]
2) DIMENSIONAL ACCURACY PER TOLERANCE SPEC. "ISO 2768-m"
3) DIMENSIONS: MILLIMETERS
4) BEND RADIUS (MIN INSIDE): ALL FOLDING RADII R=1.2MM
UNLESS OTHERWISE NOTED
DIMENSION WITHOUT TOLERANCE DIN 6930-m
DECREASING CLEANING
13:100
233
30x23 (2pcs)
Ø30x60
ø7x13 (2pcs)
Ø11.1(4pcs)
Ø7(4pcs)
Ø11.22(2pcs)
255.5
175
157.5
100
66.5
C
C - HOLES ADDED Ø11 (4pcs) AND AUTOCAD/ProE CONVERSION CARRIED OUT 12-Nov-03 JH
B
A 64612841
64612841
Prepared JHORELLI 10-Jul-03
Checked 13-Nov-03 Appr.TO 13-Nov-03
Project name
Based on
Customer
Cust. Doc. No.
ABB Ref. No.
Title BOTTOM GUIDE MODULE CC-CM
Doc. des DETAIL DRAWING
Resp. dept. EIX
Doc. number
Scale 1:2
Form A3
RevindexC.0
Lang. EN
Sheet 1
Total 2
ABB DRIVES


64512841
64512841
B
C HOLES ADDED ø11 (4pcs) AND AUTOCAD/ProE CONVERSION CARRIED OUT 12-Nov-03 JH
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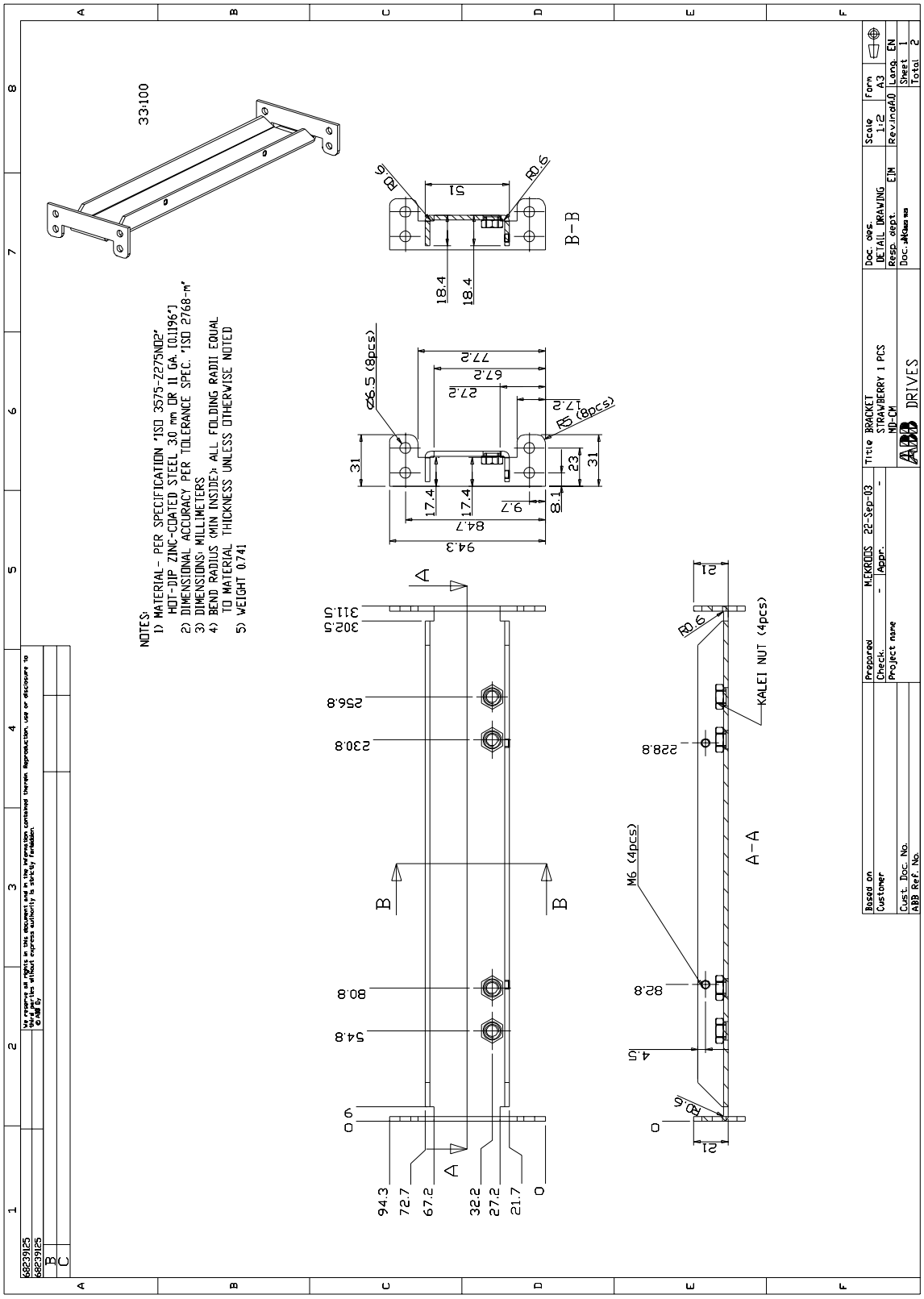
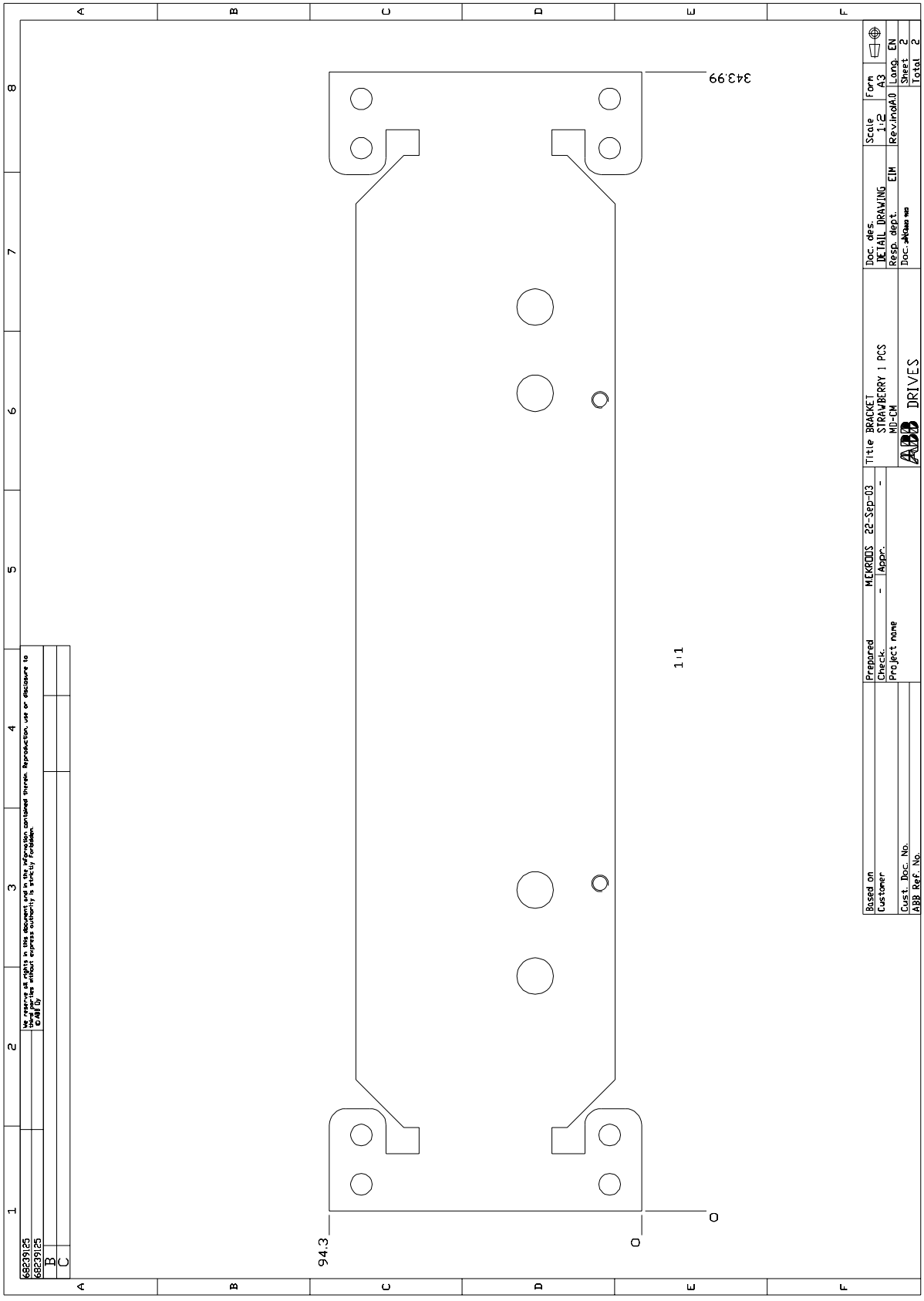
Based on
Customer
Cust. Doc. No.
ABB Ref. No.
Prepared JHARELLI 10-Jul-03
Check ME 13-Nov-03 Appr.ID 13-Nov-03
Project none
Title BOTTOM GUIDE MODULE CC-CM
ABB DRIVES
Doc. des. DETAIL DRAWING
Resp. dept. EIX
Doc. number
Scale 1:2
Rev.ind. C.0
Form A3
Lang. EN
Sheet 2
Total 2
374
280.9
0
0

Crossmembers

Rittal TS 8, 400 mm (included in kit #68256836)




343.99
94.3
0
0
1:1
Title BRACKET STRAWBERRY 1 PCS MD-CM
Doc. des DETAIL DRAWING
Scale 1:2
Form A3
Rev.ind A.0
Lang. EN
Sheet 2
Total 2
Prepared MEKRODS 22-Sep-03
Check. - Appr. -
Project name
Based on
Customer
Cust. Doc. No.
ABB Ref. No.
DRIVES
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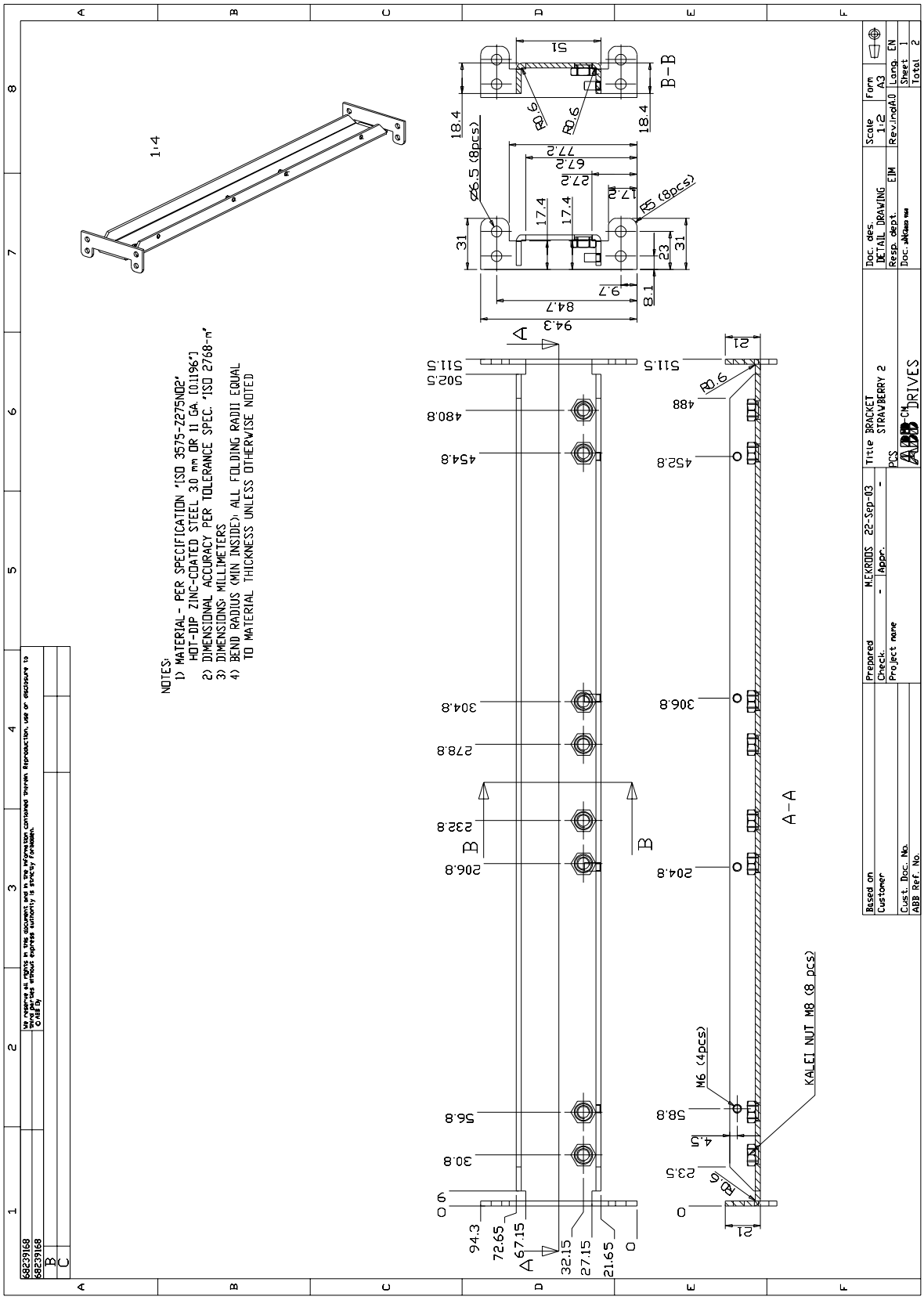
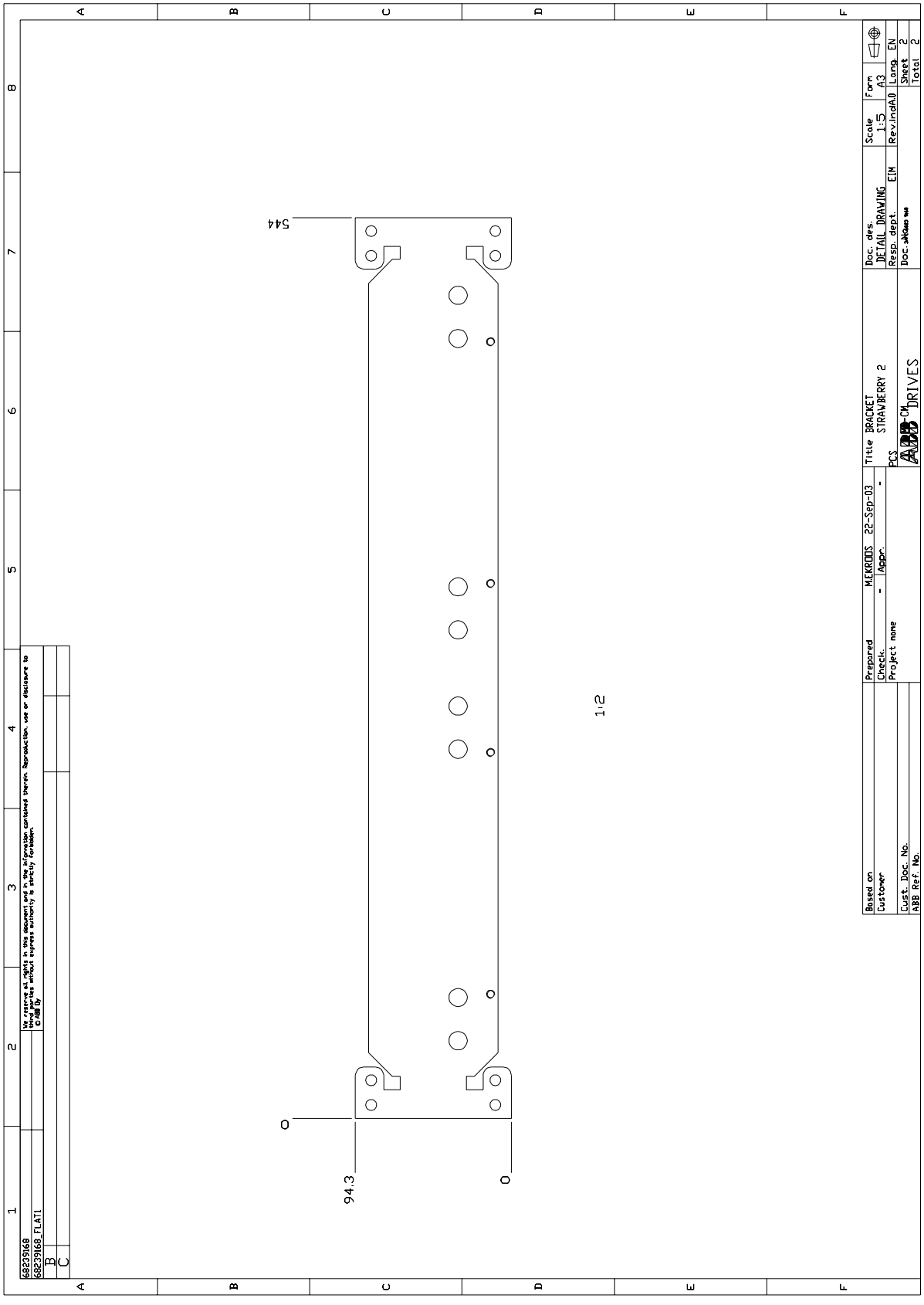
6823925
6823925
B
C

Rittal TS 8, 600 mm (included in kit #68259517)




68239168
68239168_FLAT1
B
C
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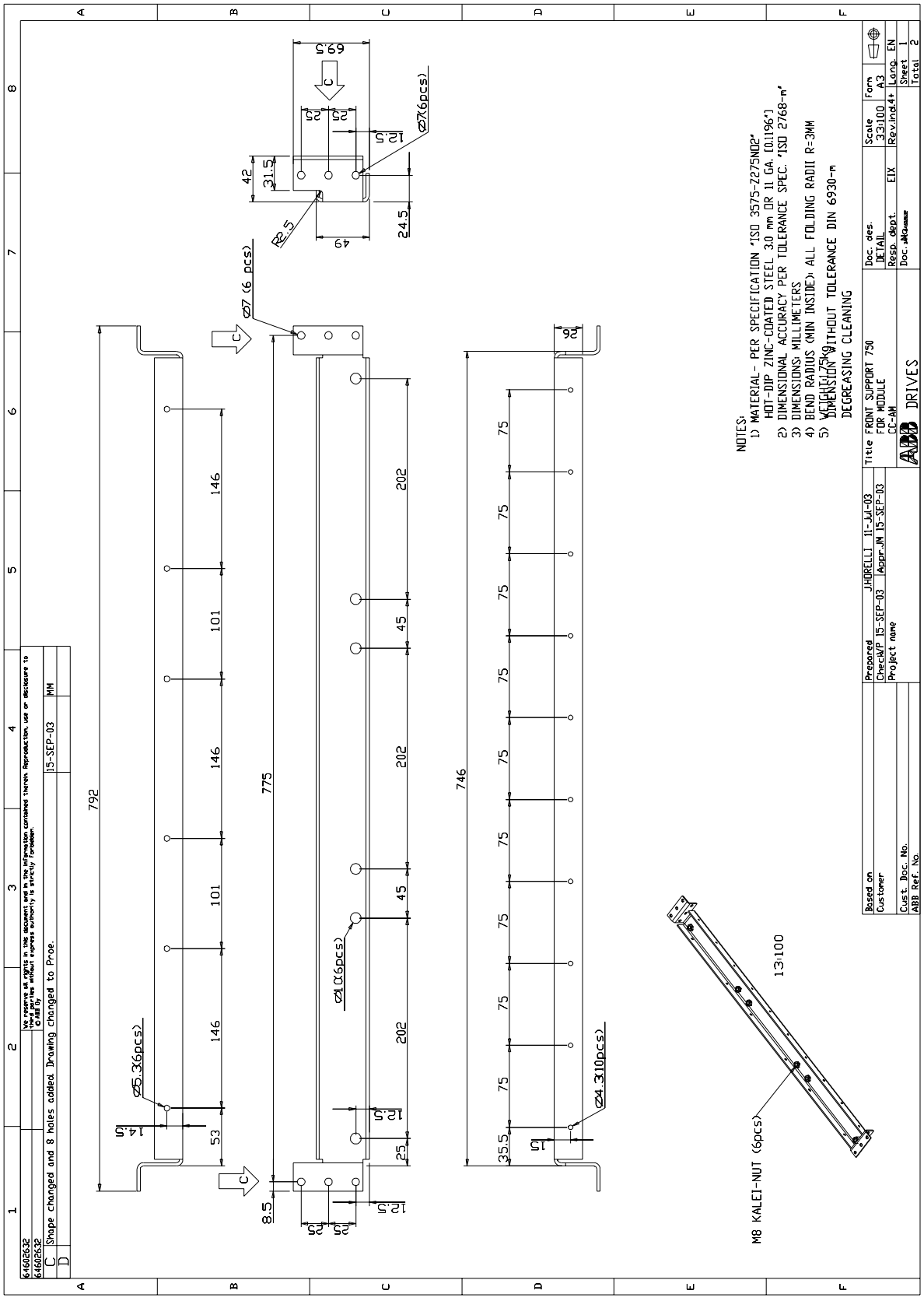
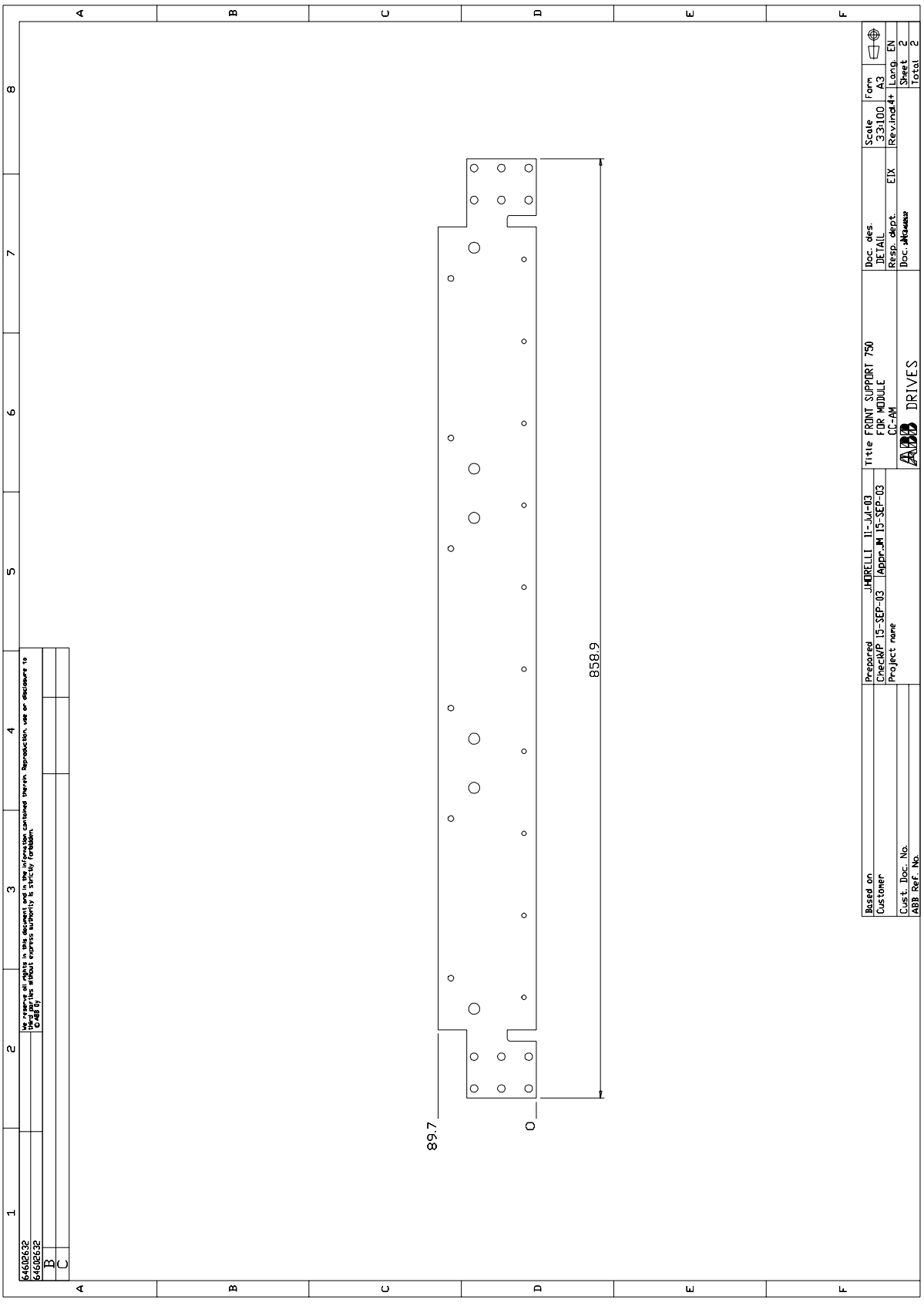
Based on
Customer
Prepared
Check
Appr.
M.EKROOS 22-Sep-03
-
-
Project name
Cust. Doc. No.
ABB Ref. No.
Title BRACKET
STRAWBERRY 2
PCS
ABB DRIVES
Doc. des.
DETAIL DRAWING
Resp. dept. EIM
Doc. status
Scale
1:5
Rev.ind A0
Form
A3
Lang. EN
Sheet 2
Total 2
1:2
544
94.3
0
0

Front crossmember, 3 modules side by side (included in kit #68259541)




89.7
0
858.9
DRIVES
FRONT SUPPORT 750
FDR MODULE
CC-AM
Scale 33:100
Form A3
Lang. EN
Sheet 2
Total 2
Prepared JMORELLI 11-Jul-03
Check'd 15-SEP-03
Appr. 15-SEP-03
Project name
Based on Customer
Cust. Doc. No.
ABB Ref. No.
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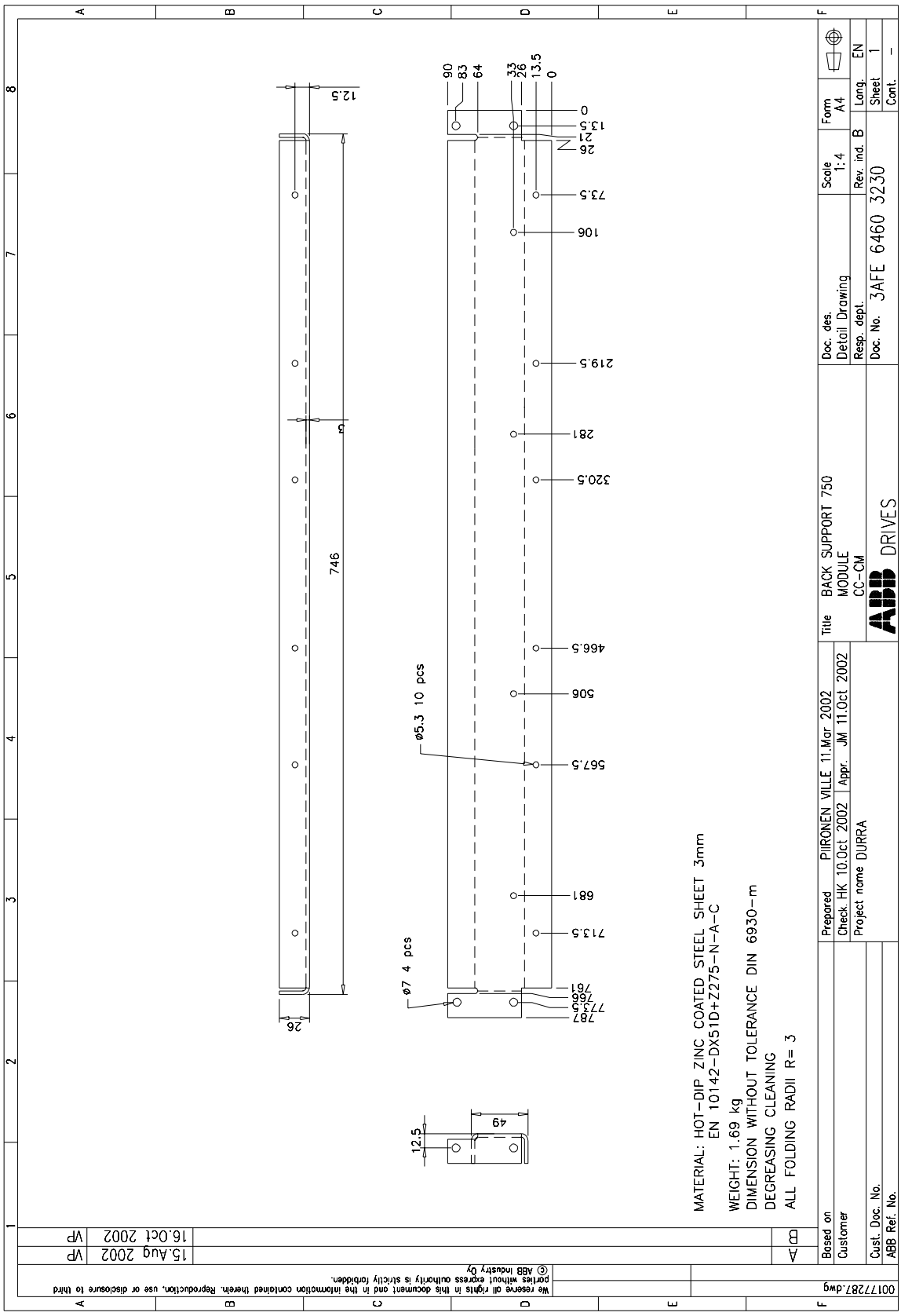
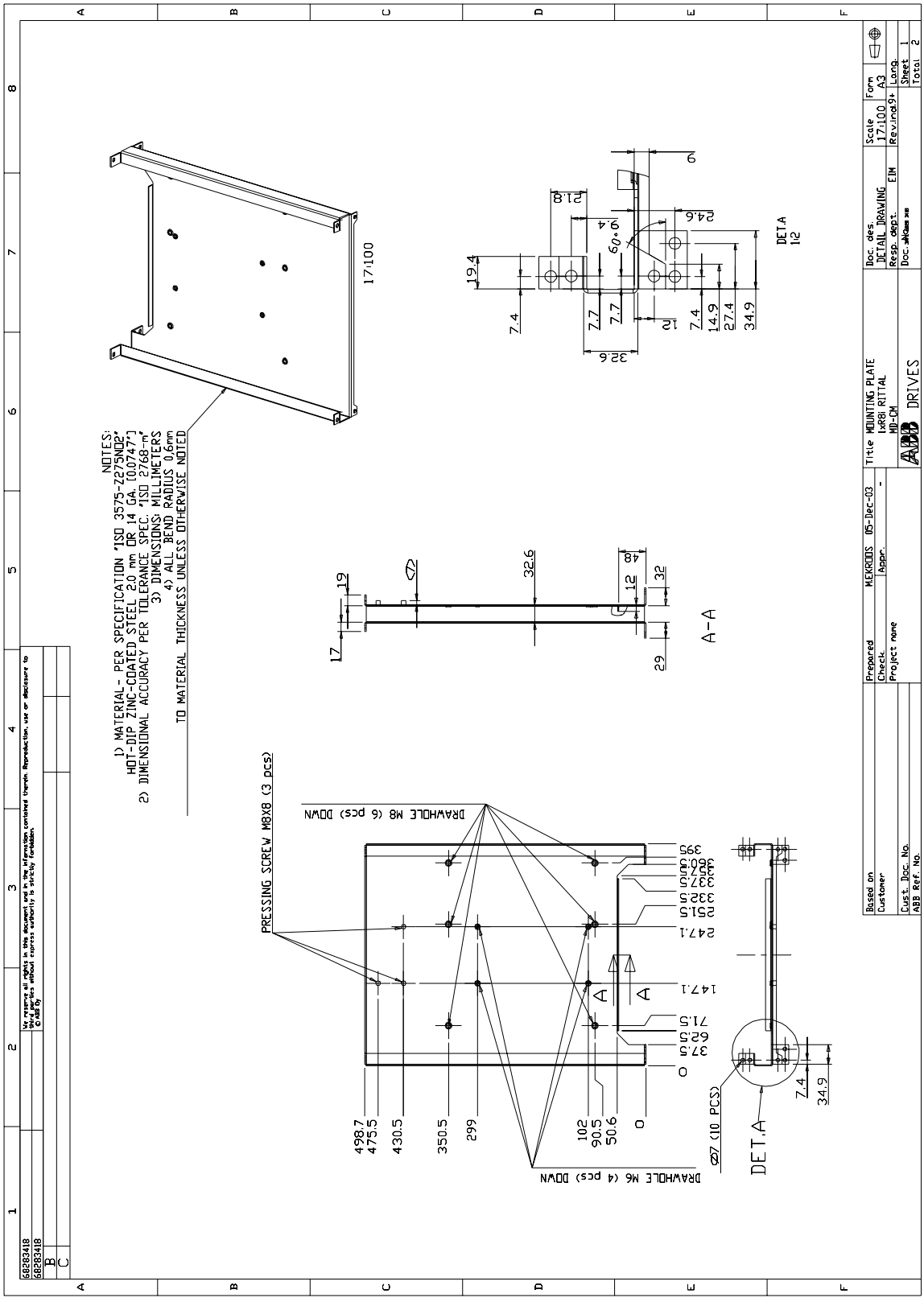
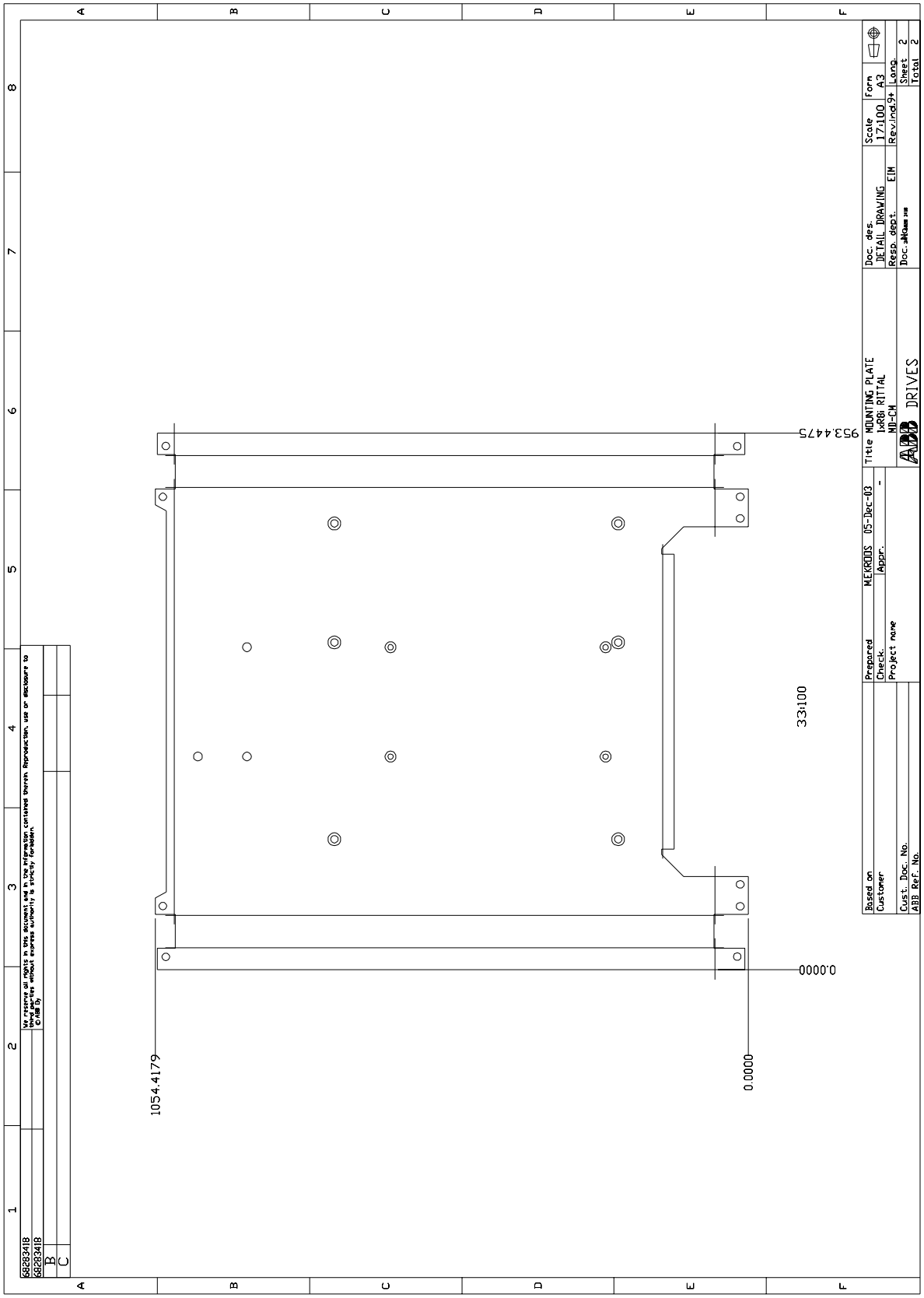
Rear crossmember, 3 modules side by side (included in kit #68259541)



Fuse/Fuse switch mounting plates

Mounting plate, single R8i mod. in a Rittal TS 8 cubicle (included in kit #68283027)




953.4475
0.0000
1054.4179
0.0000
3:1100
Title MOUNTING PLATE
1x2Bi RITTAL
MD-CM
Doc. des.
DETAIL DRAWING
Resp. dept.
EIM
Doc. number
Scale
17:100
Form
A3
Rev.ind.
9+
Long.
Sheet
2
Total
2
Prepared
MEKROOS
05-Dec-03
Check.
Appr.
-
Project name
Based on
Customer
Cust. Doc. No.
ABB Ref. No.
DRIVES
6828341B
6828341B
B
C
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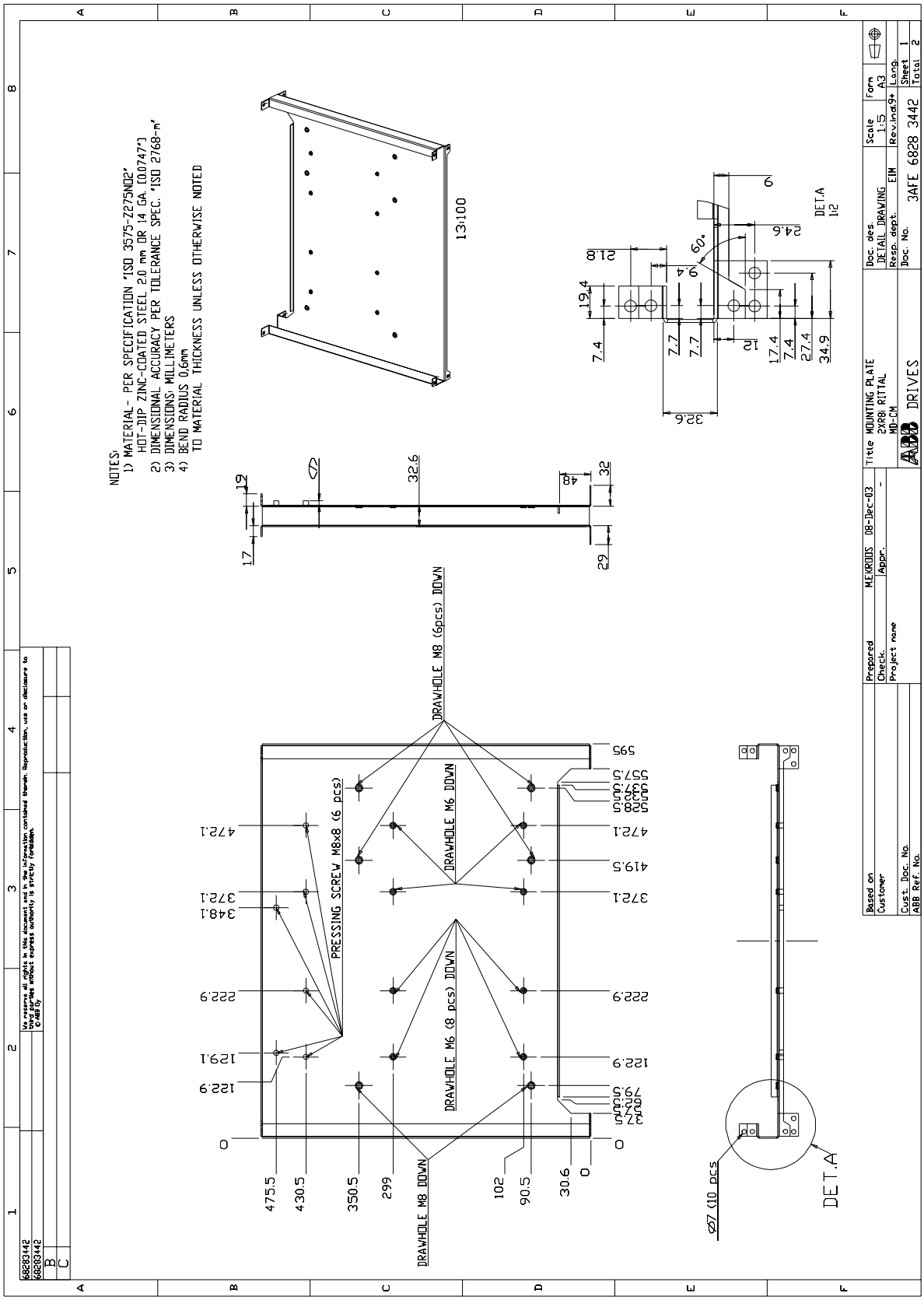
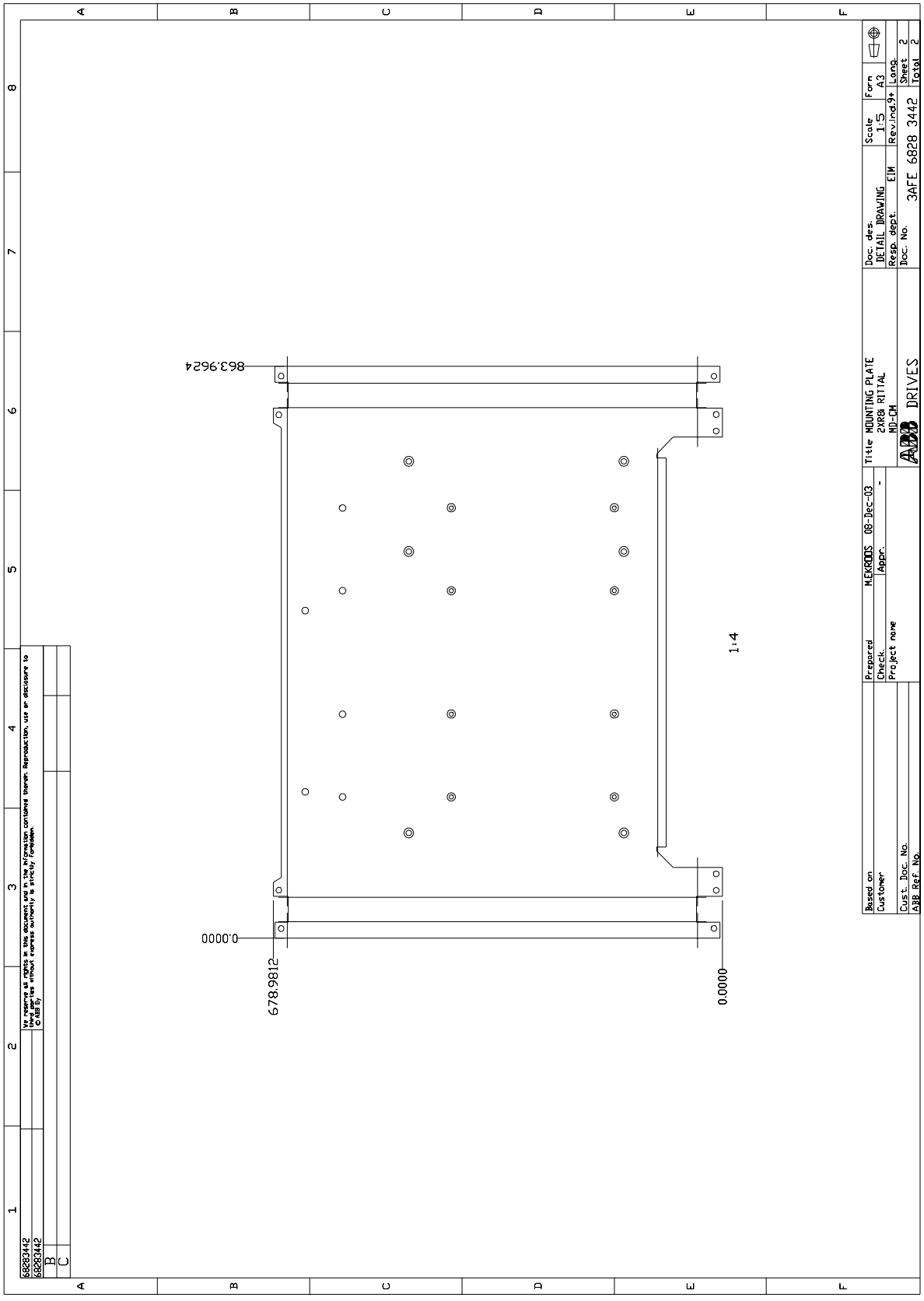
Mounting plate, two R8i modules in a Rittal TS 8 cubicle (included in kit #68283035)




863.9624
0.0000
678.9812
0.0000
1:4
Title MOUNTING PLATE
2XR8i RITTAL
MD-CM
DRIVES
Doc. des.
DETAIL DRAWING
Resp. dept.
EIM
Doc. No.
3AFE 6828 3442
Scale
1:5
Form
A3
Rev.ind.
9+
Lang.
Sheet
2
Total
2
Prepared
MEKRODS
08-Dec-03
Check.
Appr.
-
Project name
Based on
Customer
Cust. Doc. No.
ABB Ref. No.
68283442
68283442
B
C
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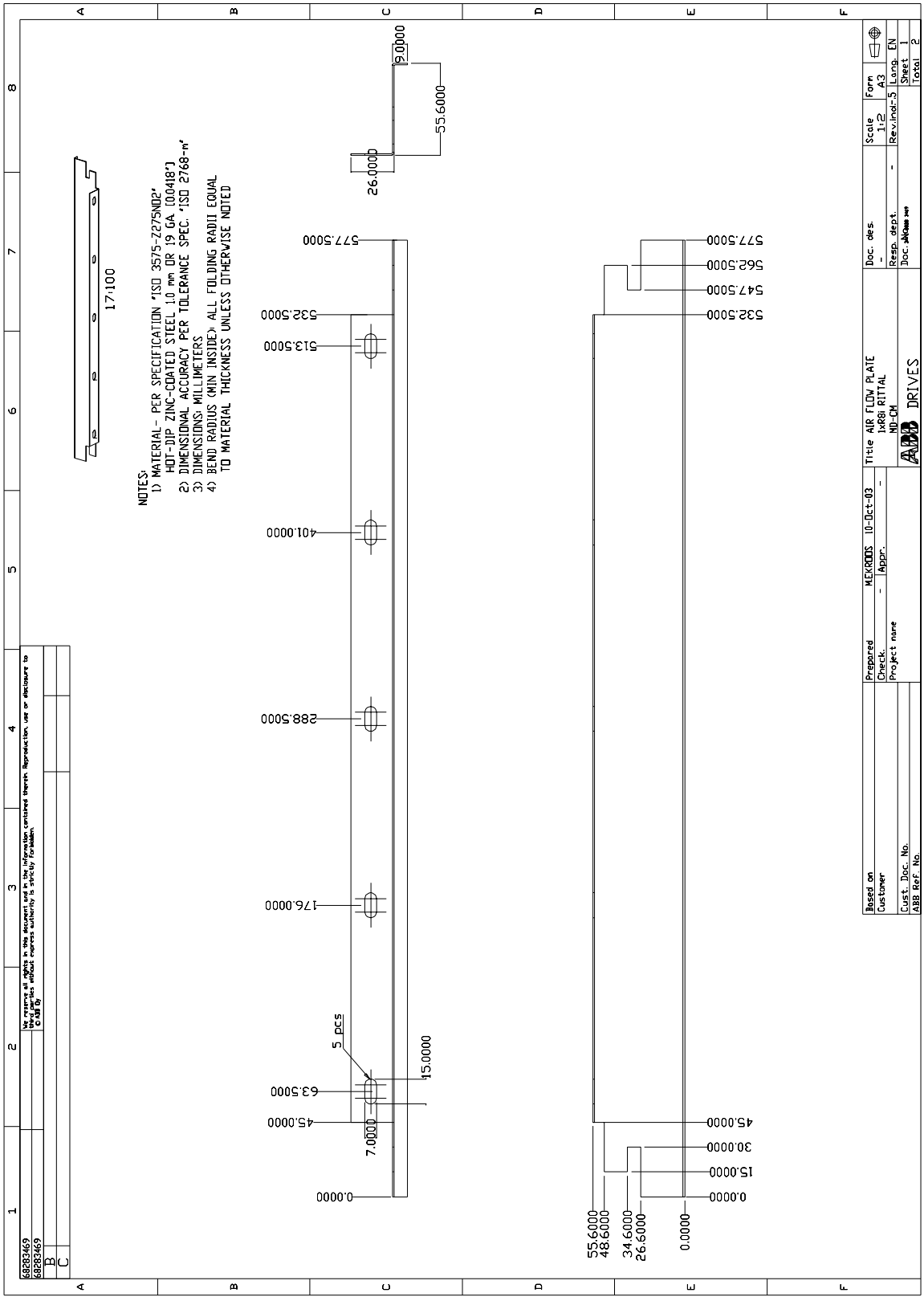
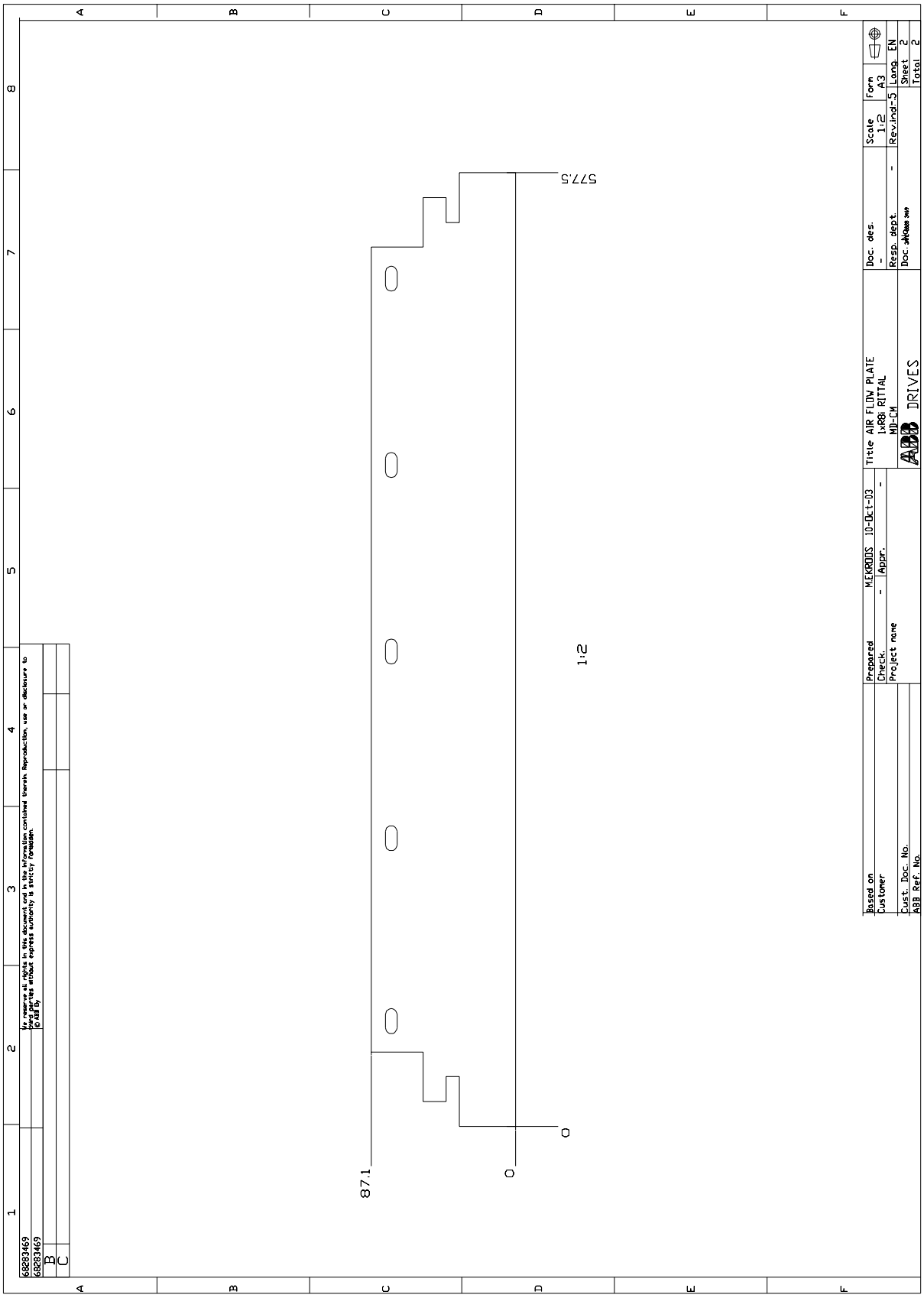
Air baffles

Air baffle, single R8i module in a Rittal TS 8 cubicle (included in kit #68283027)




577.5
87.1
0
0
1:2
68283469
68283469
B
C
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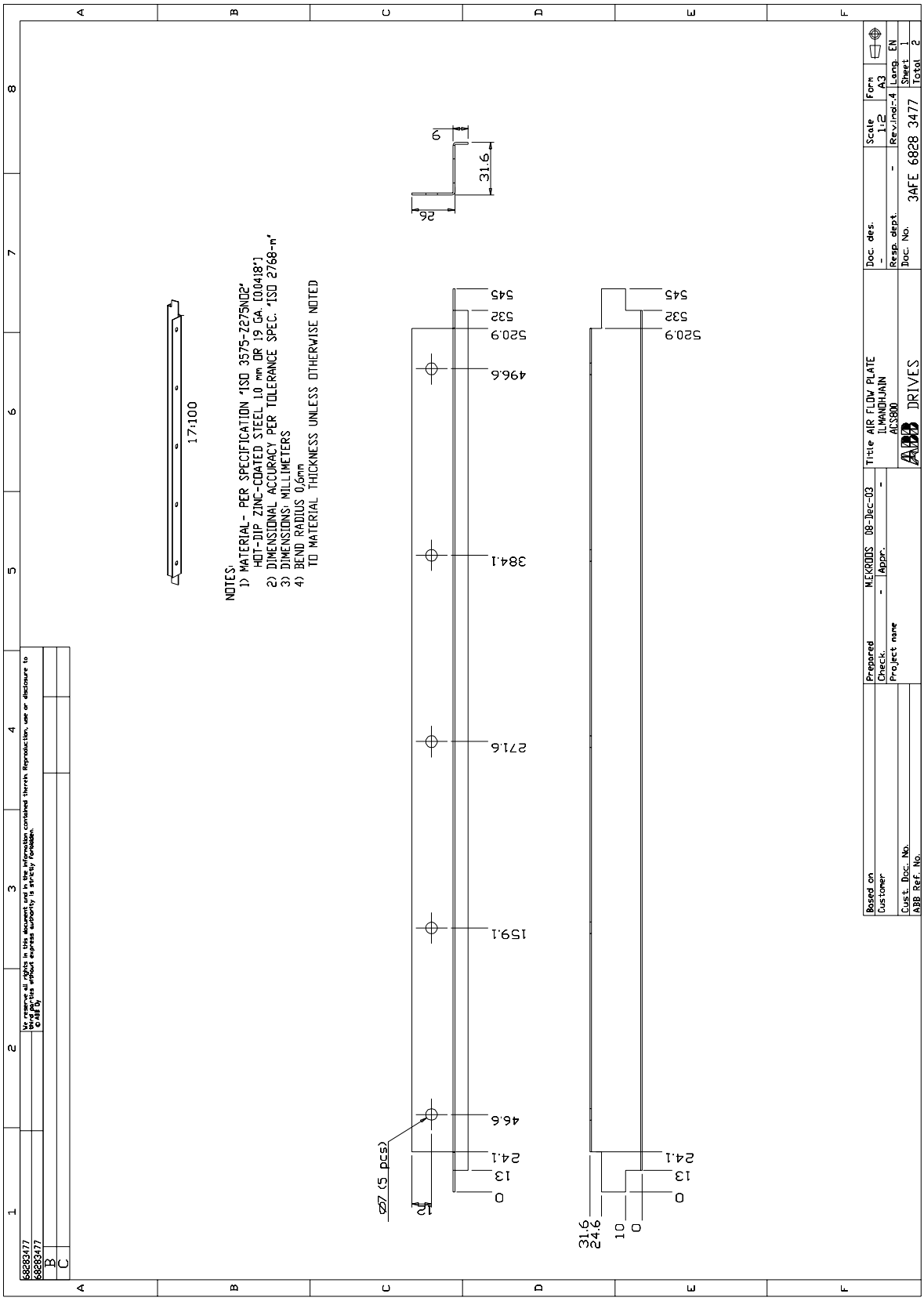
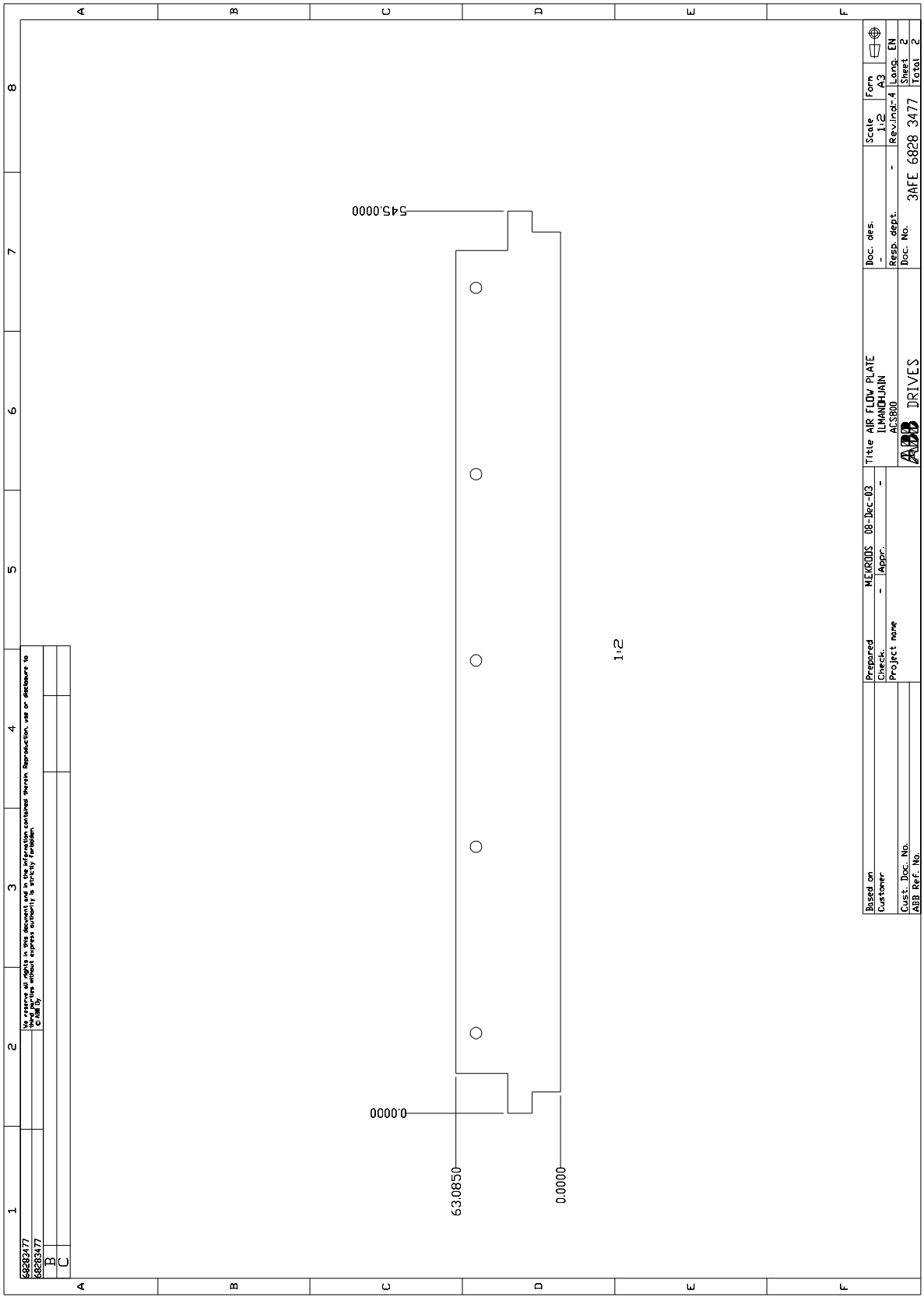
Based on
Customer
Cust. Doc. No.
ABB Ref. No.
Prepared
MEKROOS 10-Oct-03
Check.
-
Appr.
Project none
Title AIR FLOW PLATE
1xR8i RITTAL
MD-CM
ABB DRIVES
Doc. des.
-
Resp. dept.
-
Doc. status
Scale
1:2
Rev.ind.-5
Form
A3
Lang. EN
Sheet 2
Total 2

Air baffle, two R8i modules in a Rittal TS 8 cubicle (included in kit #68283035)




545.0000
0.0000
63.0850
0.0000
1:2
68283477
68283477
B
C
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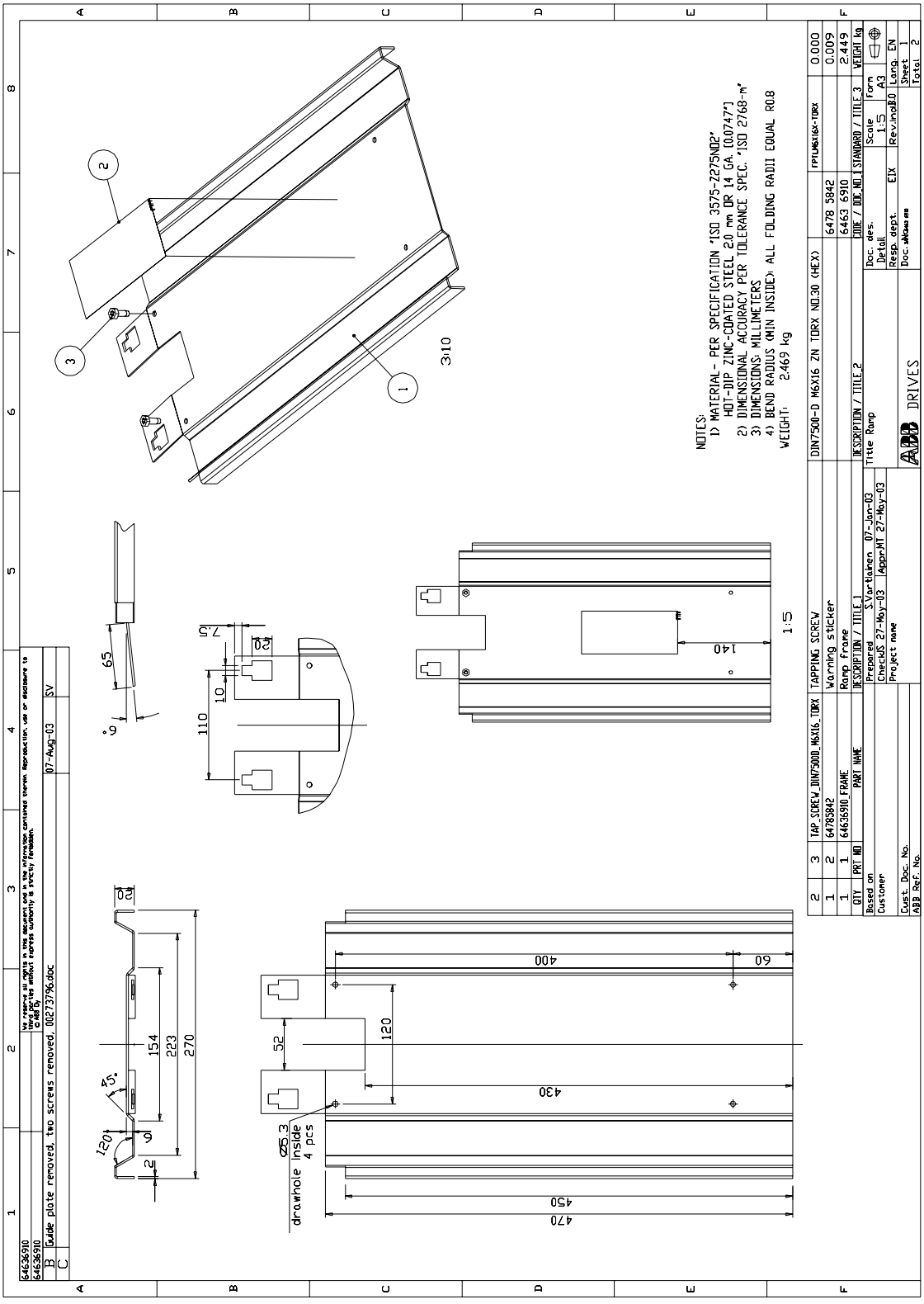
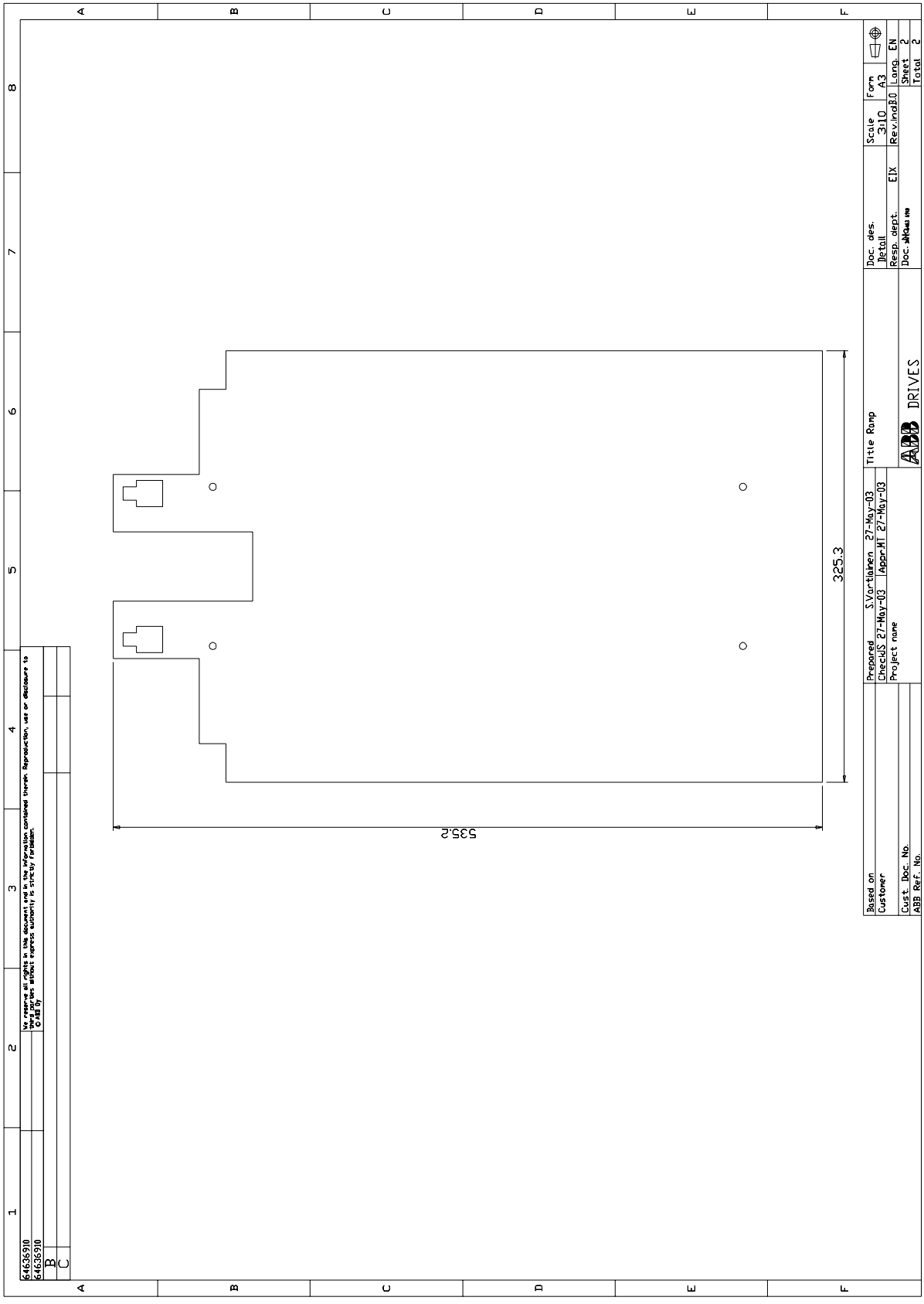
Based on
Customer
Cust. Doc. No.
ABB Ref. No.
Prepared
Check.
Appr.
Project name
MEKROOS
08-Dec-03
-
-
Title AIR FLOW PLATE
ILMANOHJAIN
ACS800
ABB DRIVES
Doc. des.
-
Resp. dept.
-
Doc. No.
3AFE 6828 3477
Scale
1:2
Rev.ind.-4
Form
A3
Lang. EN
Sheet 2
Total 2

Module extraction/insertion ramp

This example design of a module extraction/insertion ramp is for a lifting height of 50 mm, and should be redesigned for other heights.


NOTES:
1) MATERIAL - PER SPECIFICATION "ISO 3575-Z275NO2"
HOT-DIP ZINC-COATED STEEL 2.0 mm OR 14 GA. [0.0747"]
2) DIMENSIONAL ACCURACY PER TOLERANCE SPEC. "ISO 2768-m"
3) DIMENSIONS: MILLIMETERS
4) BEND RADIUS (MIN INSIDE): ALL FOLDING RADII EQUAL R0.8
WEIGHT: 2.469 kg
3:10
1:5
DRIVES
Title Ramp
Ramp frame
Warning sticker
Guide plate removed, two screws removed, 00273796.doc
07-Aug-03
Drill 4 pcs Ø5.3 through whole


325.3
535.2
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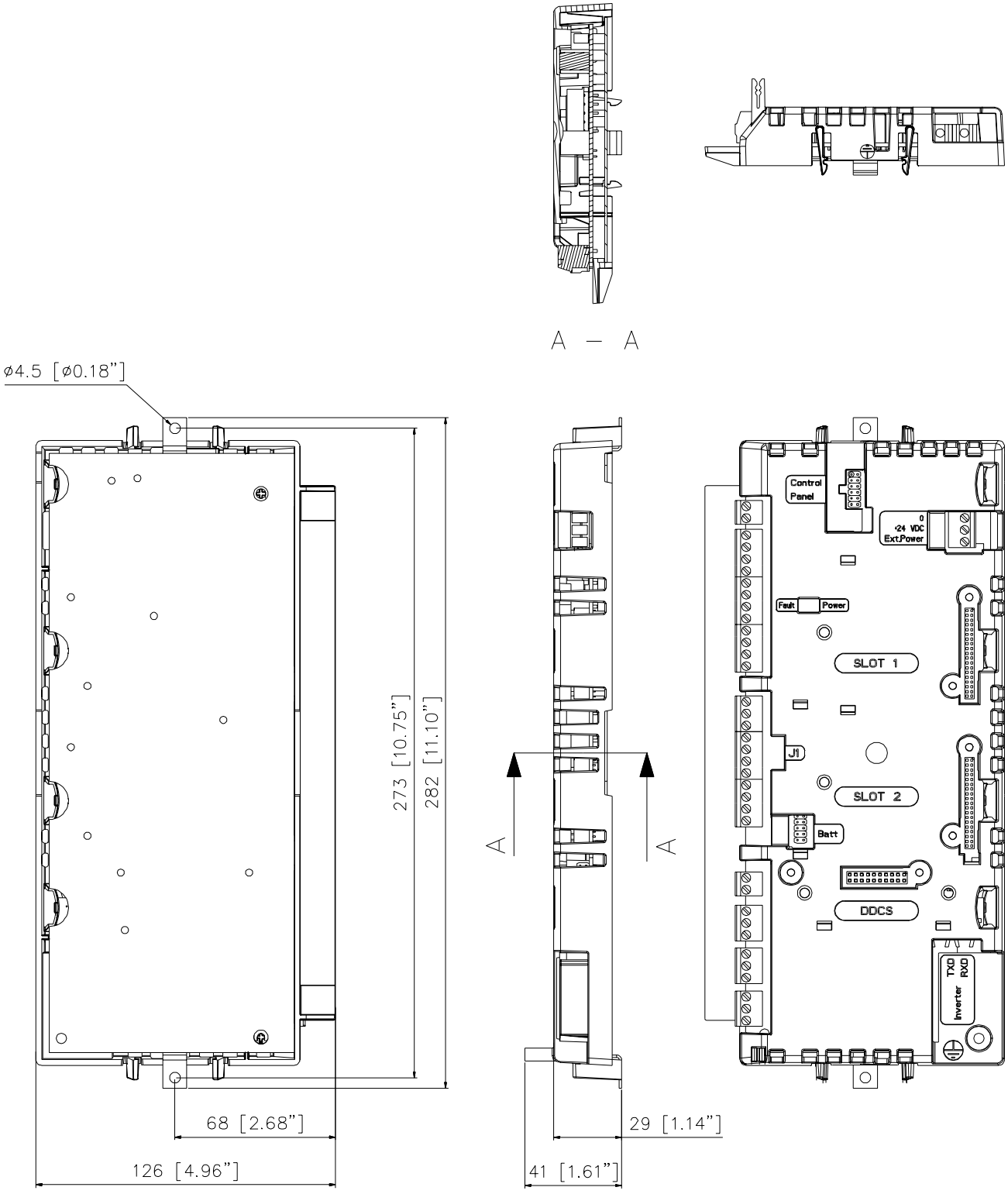
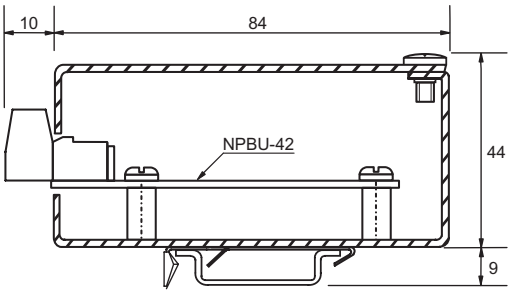
64636910
64636910
Based on
Customer
Cust. Doc. No.
ABB Ref. No.
Prepared S.Vartiainen 27-May-03
Checked 27-May-03 Appr.MT 27-May-03
Project name
Title Ramp
Doc. des.
Detail
Resp. dept. EIK
Doc. status
Scale 3:10
Rev.ind B.0
Form A3
Lang. EN
Sheet 2
Total 2
ABB DRIVES

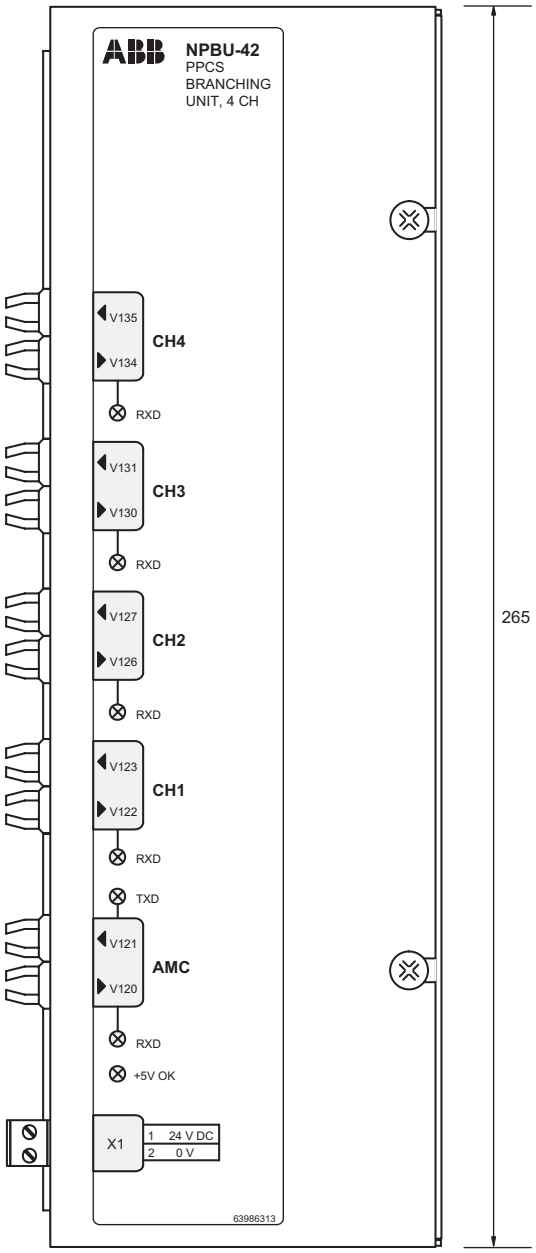
Control electronics

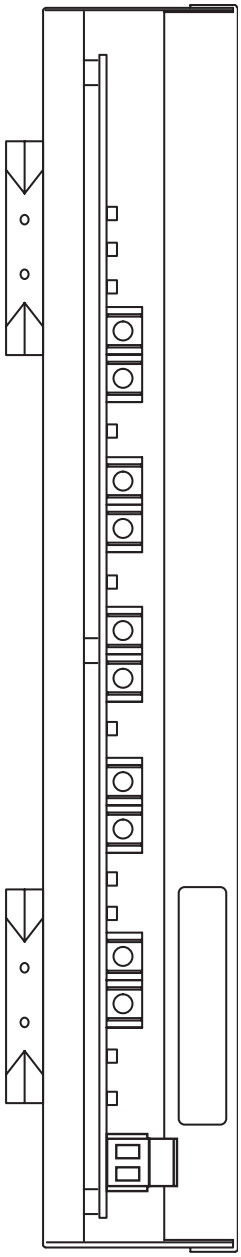
RDCU-02(C) control unit



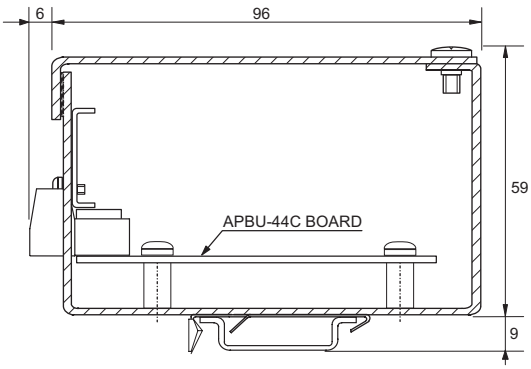
NPBU-42C branching unit

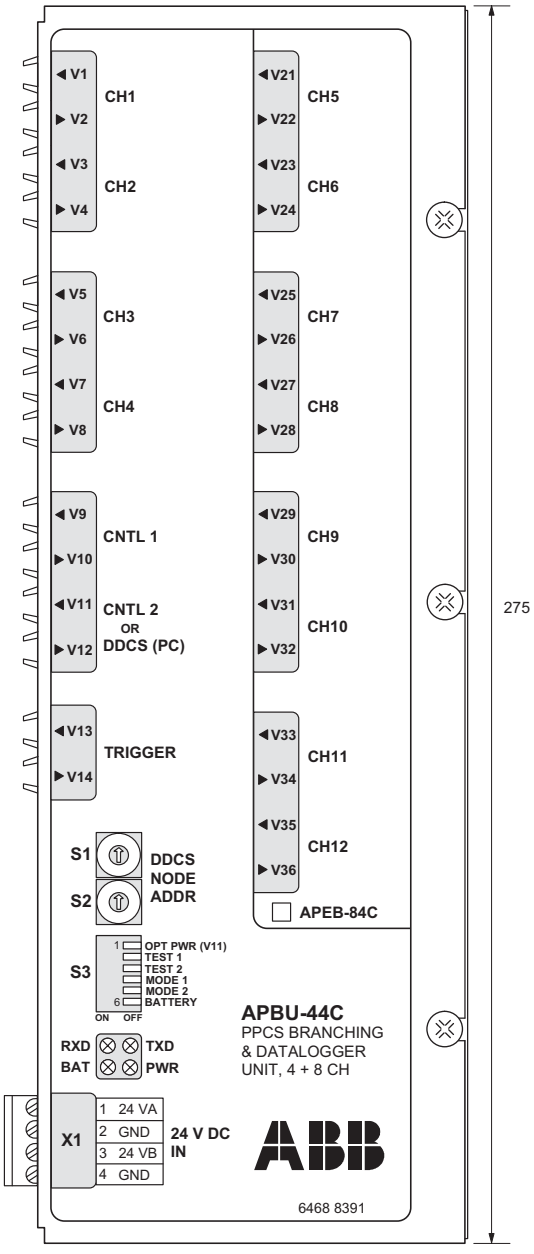


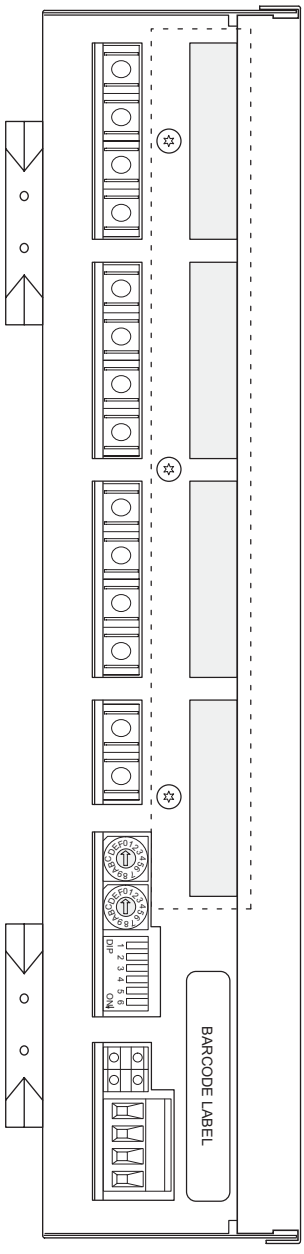




APBU-44C branching unit

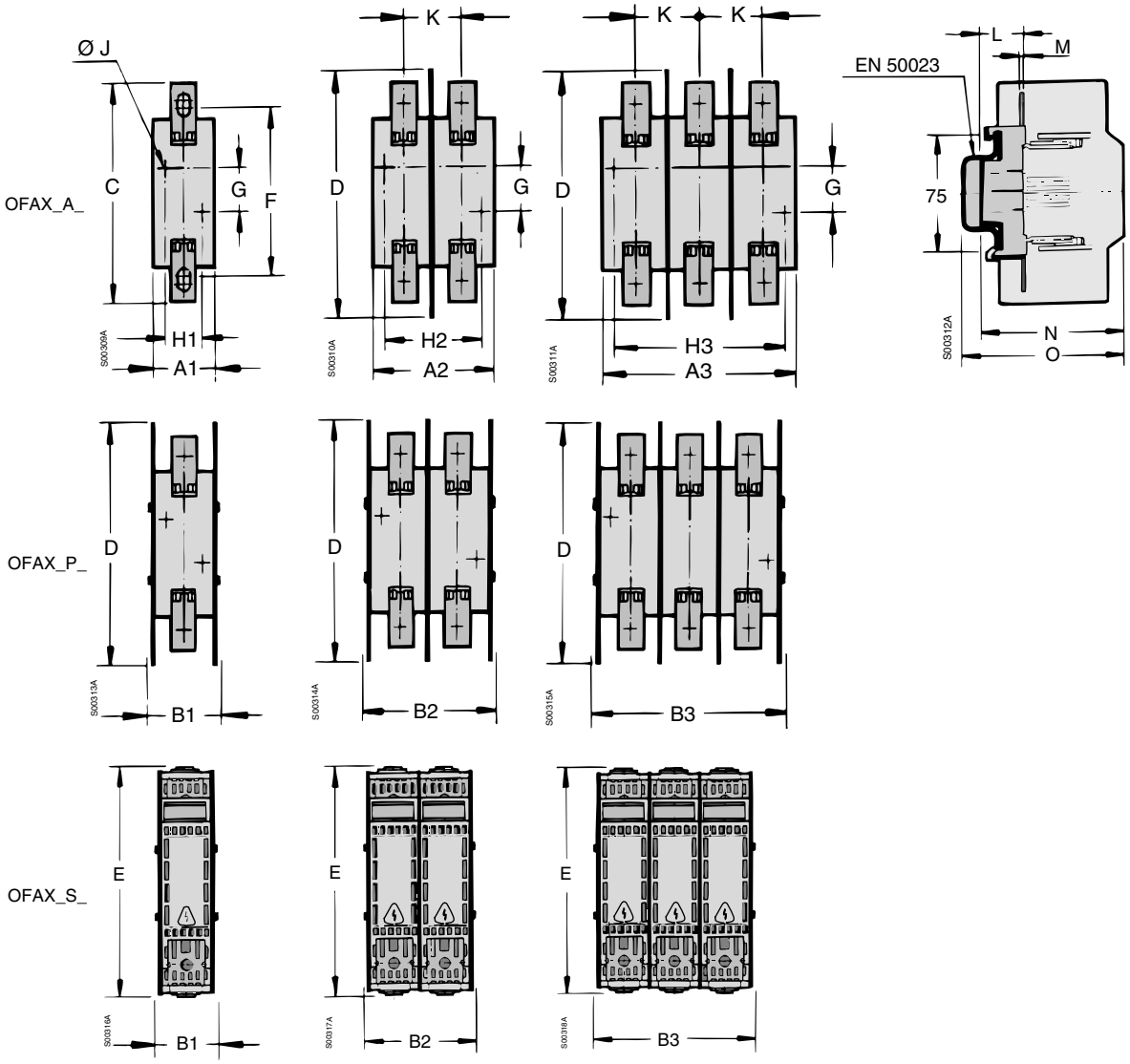






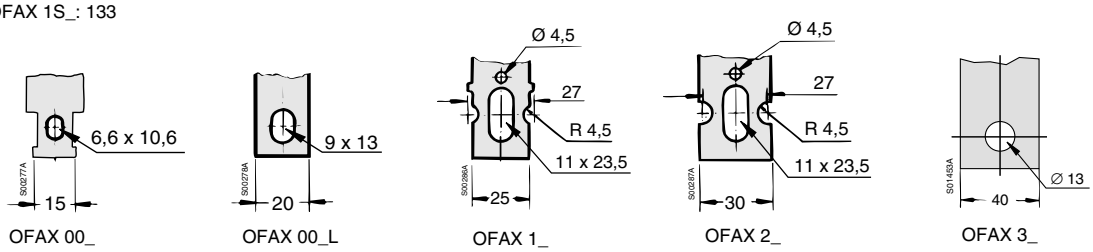
Fuse bases

OFAX series

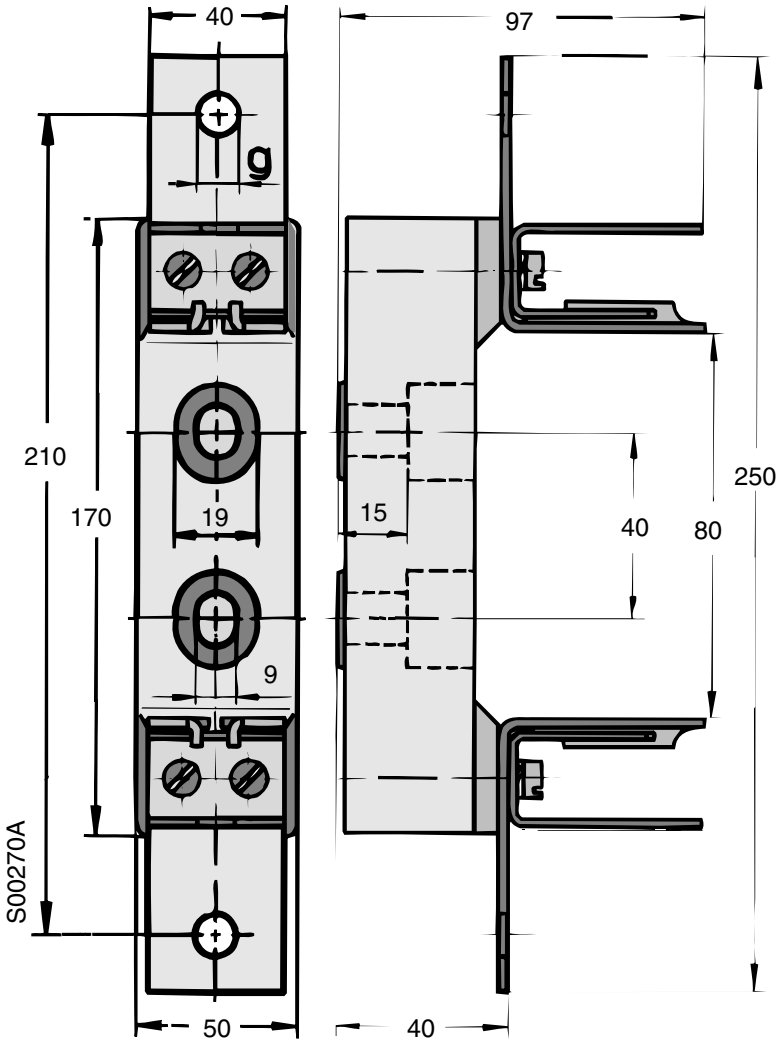


	A1	A2	A3	B1	B2	B3	C	D	E	F	G	H1	H2	H3	ØJ	K	L	M	N	O
OFAX 00_	38	74	109	42	77	112	128	145	148	100 $^{+8}_{-0}$	25	0	35	70	7.5	35	25.5	2	95	111
OFAX 1_	59.5	114.5	169.5	64	119	174	225	240	250	175 $^{+25}_{-0}$	25	30	85	140	10.5	55	41	5	109[1)]	123[2)]
OFAX 2_	69.5	134.5	199.5	84	149	214	225	240	250	175 $^{+25}_{-0}$	25	30	95	160	10.5	65	41	5	119	133
OFAX 3_	60	141.5	223	84	164	246	241	270	265	210	25	30	82	164	10.5	81.5	38	3	142.5	

[1)] OFAX 1S_: 119
[2)] OFAX 1S_: 133

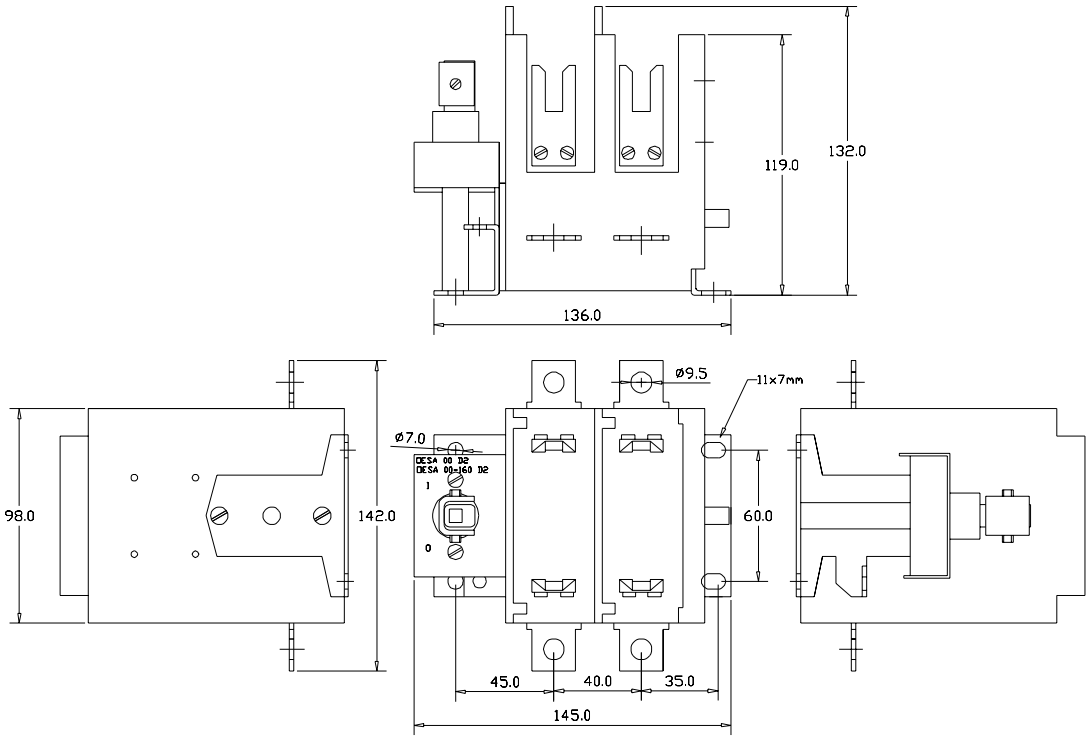


OFASA3

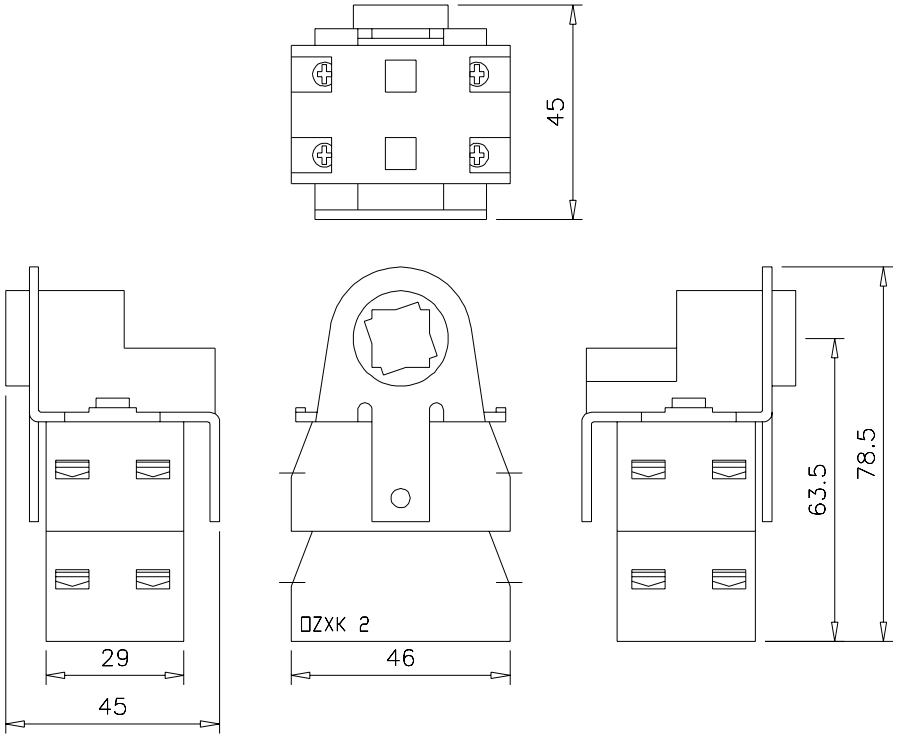


Switch fuses, charging control units

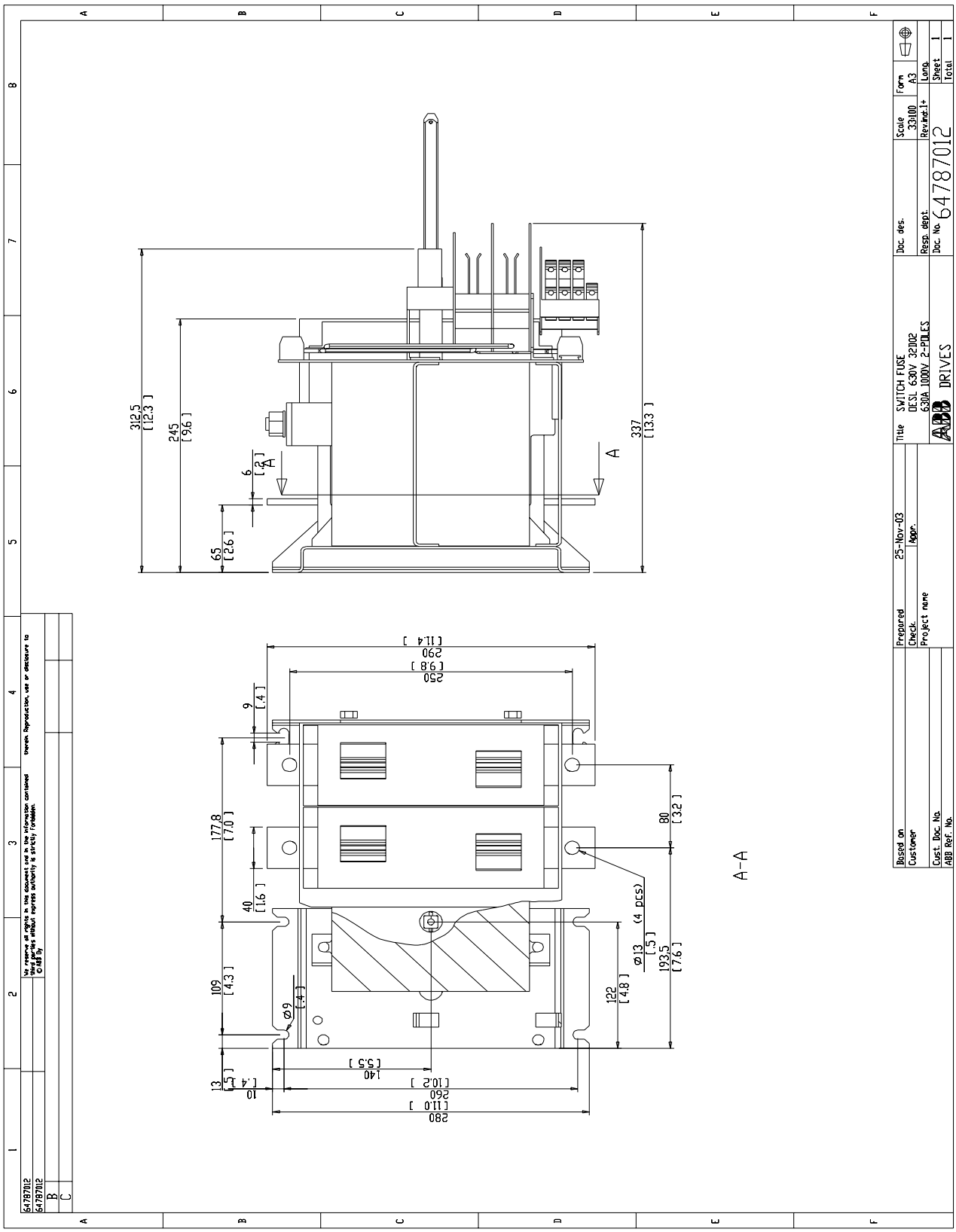
OESA00D2PL



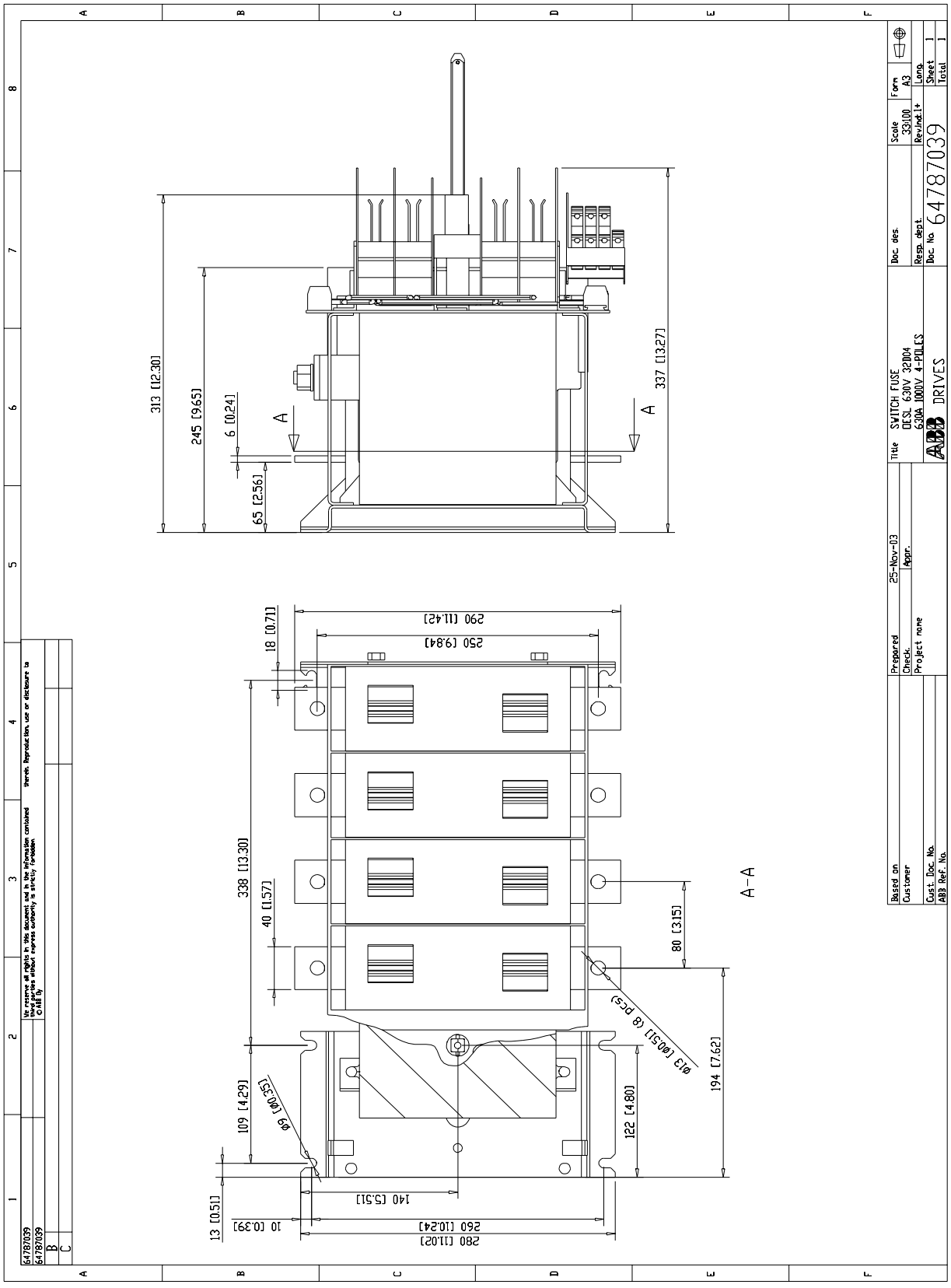
OZXK2 auxiliary contacts



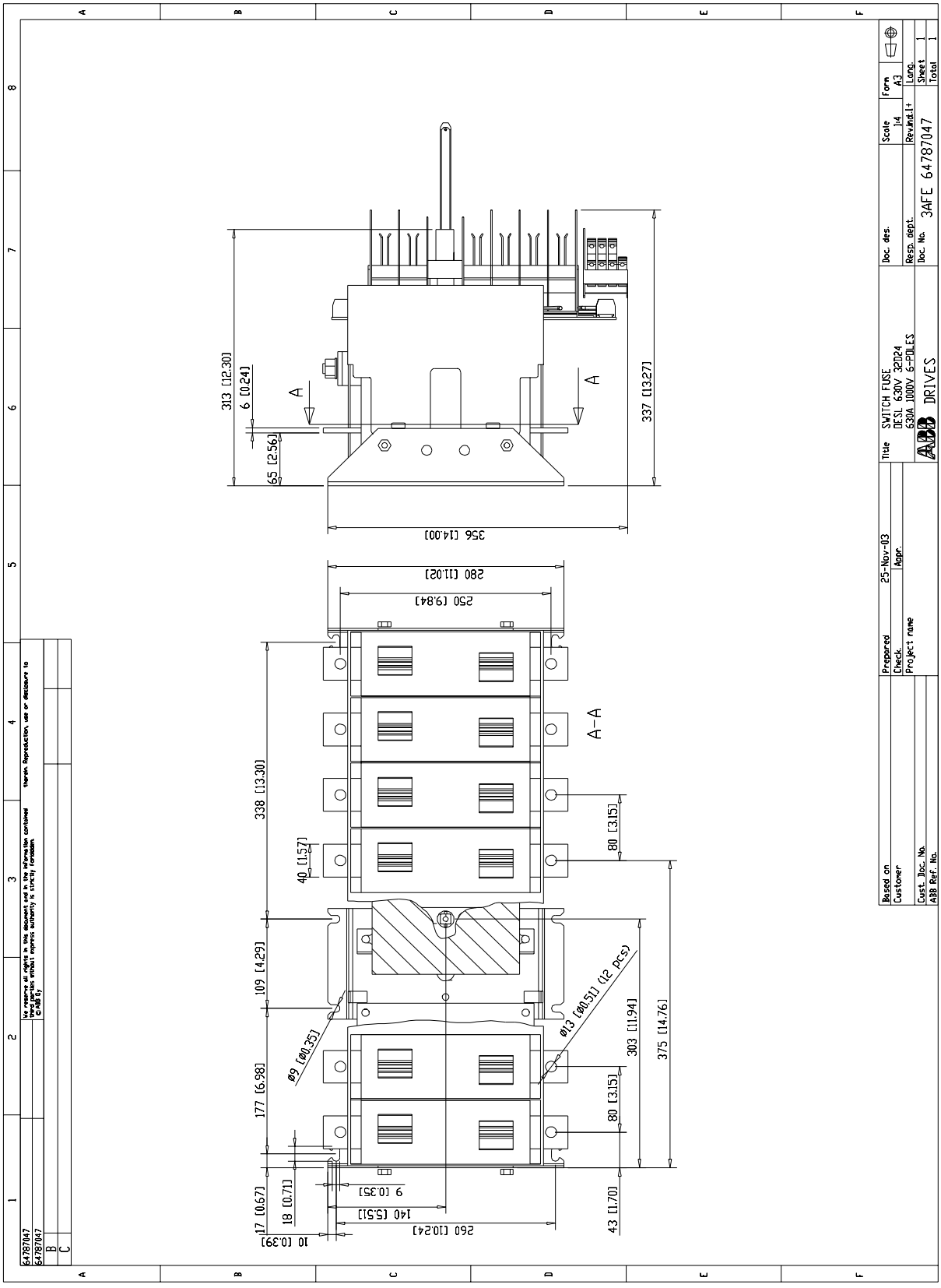
OESL 630/32D02



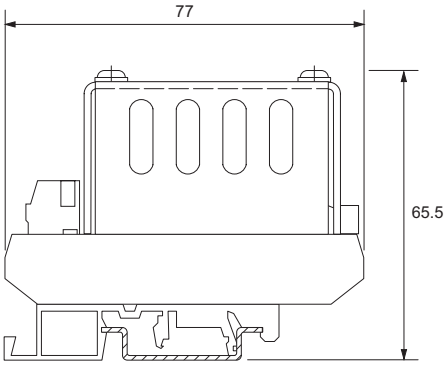
OESL 630/32D04

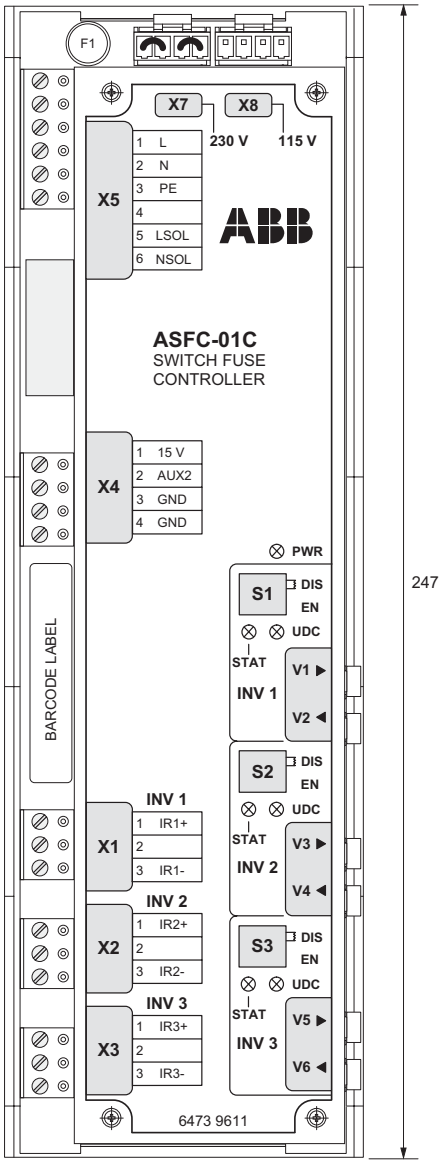


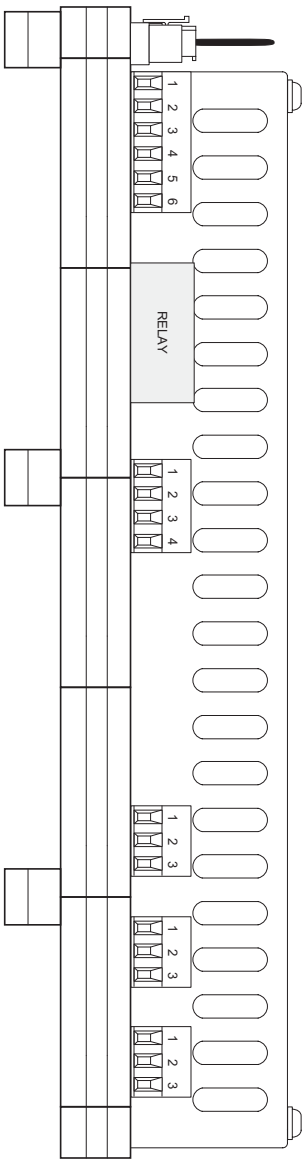
OESL 630/32D06



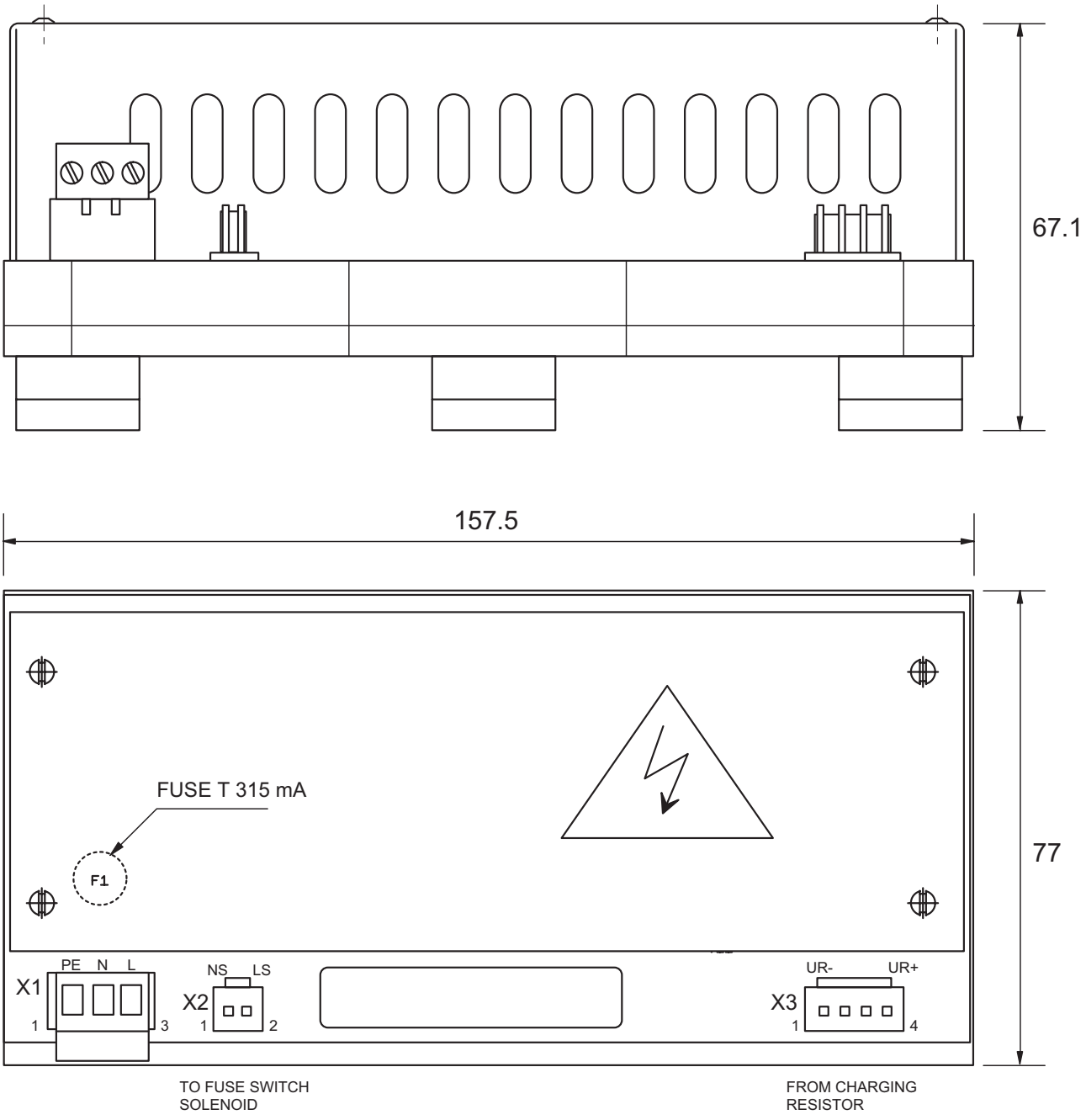
ASFC-21C switch fuse controller







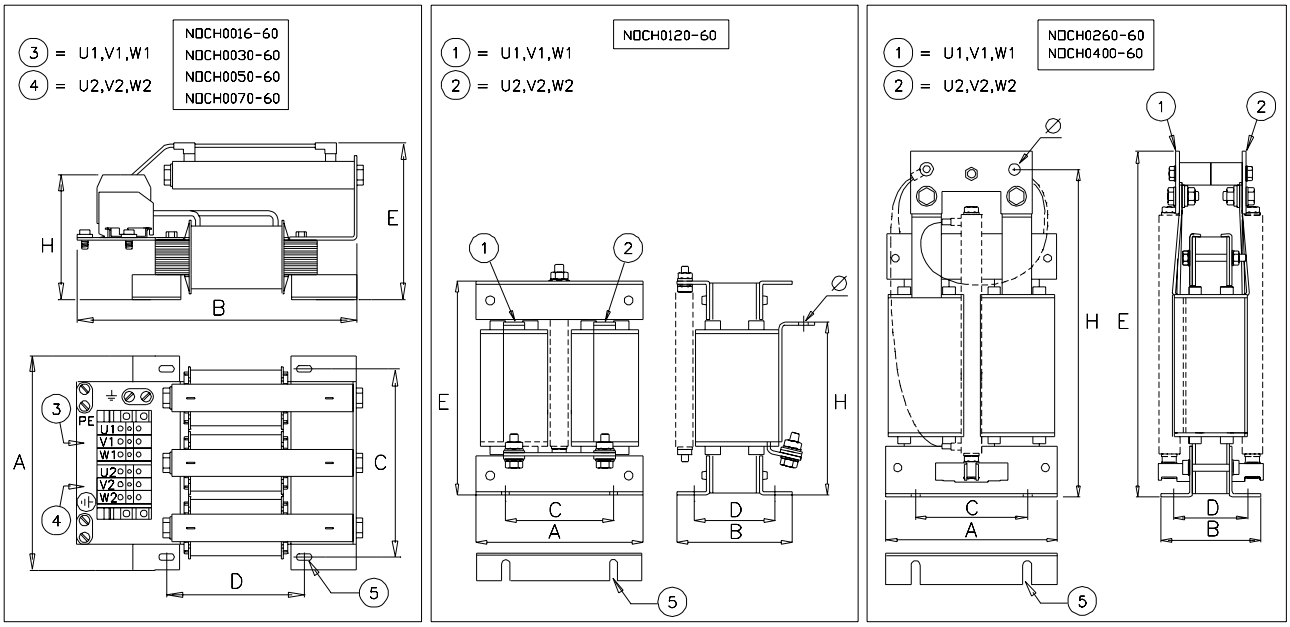
NCHM-11/21 charging control unit



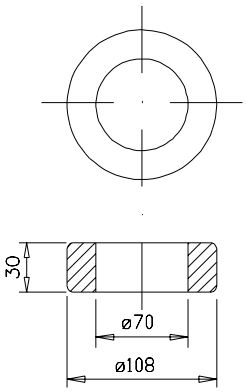
Diverse

Output (du/dt) filters

L2	A	B	C	D	E	H	⌀ mm	kg		Nm	mm²	Nm
NOCH0016-60	140	195	120	85	115	83	–	2.4	M5	4	0.2...10	1.5
NOCH0030-60	165	215	145	108	130	95	–	4.7	M5	4	0.5...16	1.5
NOCH0070-60	180	261	170	125	150	120	–	9.5	M6	6	10...35	2.5
NOCH0120-60	154	106	100	75	200	160	9	7	M8	20	–	–
NOCH0260-60	185	111	124	82	383	368	13	12	M10	30	–	–
NOCH0400-60	185	126	124	97	383	368	13	17	M10	30	–	–



Common mode filter toroids



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